

# STATE OF HAWAII PRIMARY CARE NEEDS ASSESSMENT DATA BOOK 2005



FAMILY HEALTH SERVICES DIVISION  
HAWAII DEPARTMENT OF HEALTH  
December 2005

December 2005

Funded in part by the US Public Health Service: Bureau of Health Professions, Primary Care Office Grant No. U 68 CS00178-9, and the Maternal and Child Health Bureau State Systems Development Initiative Grant No. 6 H18 MC 00012-06.

# FOREWORD

The Hawai'i Department of Health is pleased to present the fourth edition of the Primary Care Needs Assessment Data Book (Data Book).

The Data Book is intended primarily to serve as a source of comparative health statistics on 28 primary care service areas in the State of Hawai'i. By presenting comparative information on small areas, the document attempts to provide a glimpse of the variation among communities in terms of selected risk and resource indicators. This enables communities not only to examine their specific needs, but also to have a sense of the big picture as they assess their own health care needs and problems over time.

It is my hope that this document will be a useful source of quantitative information to health policymakers, planners and all of us in the community who share a common desire to improve access to primary care, especially for the underserved and vulnerable populations of Hawai'i.

Chiyome Leinaala Fukino, M.D.  
Director of Health

# ACKNOWLEDGMENTS

The Family Health Services Division appreciates the assistance given by the following organizations in providing data for this document:

- Hawai'i Department of Health, Office of Health Status Monitoring;
- Hawai'i Department of Health, Behavioral Risk Factor Surveillance System;
- Hawai'i Department of Health. Family Health Services Division;
- Hawai'i Department of Labor and Industrial Relations, Research and Statistics Office;
- Hawai'i Department of Human Services, Information Systems Office; and
- Hawai'i Outcomes Institute

The following Family Health Services Division, DOH, personnel directed the design and creation of this document:

- Loretta J. Fuddy A.C.S.W., M.P.H.; *Chief, Family Health Services Division*
- Charlene P. Gaspar, R.N., M.P.H.; *Coordinator, Hawai'i Primary Care Office*
- Mark A. Eshima, M.A.; *Research Statistician, Family Health Services Division*

# TABLE OF CONTENTS

FOREWORD. . . . .	iii
ACKNOWLEDGMENTS. . . . .	iv
TABLE OF CONTENTS. . . . .	v
LIST OF CHARTS. . . . .	vi
LIST OF TABLES. . . . .	vii
LIST OF MAPS. . . . .	viii
<b>CHAPTER 1 INTRODUCTION. . . . .</b>	<b>1</b>
Purpose. . . . .	1
Delineation of Service Areas. . . . .	1
<b>CHAPTER 2 PRIMARY CARE ACCESS INDICATORS. . . . .</b>	<b>5</b>
CATEGORIES OF DATA. . . . .	5
DATA LIMITATIONS AND INTERPRETATION. . . . .	5
Comparison and ranking of service areas. . . . .	5
Notes on confidence intervals. . . . .	5
The small numbers problem. . . . .	6
PRIMARY CARE ACCESS INDICATORS. . . . .	7
Population status. . . . .	7
Health status. . . . .	15
Socio-economic status. . . . .	26
<b>CHAPTER 3 INDICATORS OF RISK AND RESOURCES. . . . .</b>	<b>35</b>
RISK INDICATORS. . . . .	35
METHODOLOGY FOR RISK SCORING. . . . .	35
<b>CHAPTER 4 FEDERAL DESIGNATIONS. . . . .</b>	<b>43</b>
BACKGROUND ON FEDERAL DESIGNATIONS . . . . .	43
Health Professional Shortage Area. . . . .	43
Medically Underserved Area/Population. . . . .	43
Rural Health Center. . . . .	43
Federally Qualified Health Center. . . . .	44
National Health Service Corps. . . . .	44
<b>DEVELOPMENTAL HEALTH RISK INDEXES. . . . .</b>	<b>55</b>

# LIST OF CHARTS

	Page
CHART 1	PERCENTAGE OF POPULATION AGE 65 YEARS AND OVER..... 9
CHART 2	PERCENTAGE OF POPULATION AGE 17 AND BELOW..... 10
CHART 3	BIRTH RATE OF WOMEN AGE 18 TO 44 YEARS. .... 11
CHART 4	RESIDENT POPULATION BY SERVICE AREA..... 12
CHART 5	NATIVE HAWAIIAN POPULATION BY SERVICE AREA..... 13
CHART 6	PERCENTAGE OF NATIVE HAWAIIANS BY SERVICE AREA..... 14
CHART 7	INFANT MORTALITY RATE..... 19
CHART 8	PERCENTAGE OF BIRTHS WITH INADEQUATE PRENATAL CARE. 21
CHART 9	PERCENTAGE OF BIRTHS WITH LOW BIRTH WEIGHT. .... 23
CHART 10	PERCENTAGE OF TEEN BIRTHS..... 25
CHART 11	PER CAPITA INCOME. .... 27
CHART 12	PERCENTAGE OF POPULATION BELOW 200% OF FEDERAL POVERTY LEVEL..... 28
CHART 13	PERCENTAGE OF POPULATION BELOW 100% OF FEDERAL POVERTY LEVEL..... 29
CHART 14	UNEMPLOYMENT RATE..... 30
CHART 15	PERCENTAGE OF POPULATION 18 YEARS AND OVER WITH NO HIGH SCHOOL DIPLOMA. .... 31
CHART 16	PERCENTAGE OF HOUSEHOLDS RECEIVING FINANCIAL AID. ... 32
CHART 17	PERCENTAGE OF HOUSEHOLDS RECEIVING FOOD STAMPS. ... 33
CHART 18	PERCENTAGE OF ADULT POPULATION WITH DIABETES. .... 57
CHART 19	PERCENTAGE OF OBESE ADULTS..... 59
CHART 20	PERCENTAGE OF ADULT SMOKERS. .... 61
CHART 21	STROKE MORTALITY RATE AMONG ADULTS. .... 63
CHART 22	CHRONIC HEART DISEASE MORTALITY RATE. .... 65
CHART 23	PERCENTAGE OF ADULTS WHO VISITED A DENTIST WITHIN THE PAST YEAR. .... 69
CHART 24	PERCENTAGE OF ADULTS WHO HAD A PERMANENT TOOTH REMOVED. .... 71
CHART 25	PERCENTAGE OF ADULTS WHO HAD THEIR TEETH CLEANED WITHIN THE PAST YEAR. .... 73

# LIST OF TABLES

	Page
TABLE 1	INFANT MORTALITY. .... 18
TABLE 2	INADEQUATE PRENATAL-CARE BIRTHS. .... 20
TABLE 3	LOW BIRTH WEIGHT. .... 22
TABLE 4	BIRTHS TO TEENS AGE 10 TO 17 YEARS. .... 24
TABLE 5	MATERNAL AND CHILD HEALTH RISK INDICATORS. .... 37
TABLE 6	RANKING BASED ON MATERNAL AND CHILD HEALTH RISK SCORE. .... 38
TABLE 7	SOCIO-ECONOMIC RISK INDICATORS. .... 39
TABLE 8	RANKING BASED ON SOCIO-ECONOMIC SCORES. .... 40
TABLE 9	RANKING BASED ON COMBINED RISK SCORES. .... 41
TABLE 10	ELIGIBILITY CRITERIA AND DATA REQUIREMENTS FOR A SHORTAGE DESIGNATION. .... 45
TABLE 11	STATUS OF FEDERAL DESIGNATIONS AND ASSISTANCE. .... 52
TABLE 12	RISK SCORES & CLASSIFICATIONS OF FEDERAL DESIGNATIONS. .... 53
TABLE 13	ADULT DIABETES PREVALENCE. .... 56
TABLE 14	ADULT OBESITY. .... 58
TABLE 15	ADULT SMOKER. .... 60
TABLE 16	STROKE MORTALITY RATE (age adjusted). .... 62
TABLE 17	CHRONIC HEART DISEASE MORTALITY RATE (age adjusted). .... 64
TABLE 18	CHRONIC DISEASE HEALTH RISK INDICATORS. .... 66
TABLE 19	RANKING BASED ON CHRONIC DISEASE RISK SCORES. .... 67
TABLE 20	VISITED DENTIST WITHIN THE PAST YEAR. .... 68
TABLE 21	PERMANENT TEETH REMOVED. .... 70
TABLE 22	TEETH CLEANED WITHIN THE PAST YEAR. .... 72
TABLE 23	ORAL HEALTH RISK INDICATORS. .... 74
TABLE 24	RANKING BASED ON ORAL HEALTH RISK SCORES. .... 75

# LIST OF MAPS

	Page
MAP 1 LOCATION OF PRIMARY CARE RATIONAL SERVICE AREAS. ....	3
MAP 2 LOCATION OF SERVICE AREAS WITH RELATIVELY HIGH COMBINED RISK SCORES.....	46
MAP 3 LOCATION OF FEDERALLY DESIGNATED MUAS/MUPS. ....	47
MAP 4 LOCATION OF FEDERALLY DESIGNATED PRIMARY CARE HPSAS. . .	48
MAP 5 LOCATION OF DESIGNATED DENTAL HPSAS.....	49
MAP 6 LOCATION OF FEDERALLY DESIGNATED MENTAL HEALTH HPSAS. .	50
MAP 7 LOCATION OF COMMUNITY HEALTH CENTERS.....	51



# CHAPTER 1 INTRODUCTION

## Purpose

The *Primary Care Needs Assessment Data Book* is a compendium of comparative health statistics on 28 primary care service areas in the State of Hawai'i. It is intended to assist policymakers, health planners, health care professionals and community members in making assessments of the relative health risks and primary health care needs of these communities. The comparison of areas throughout the state allows planners and policymakers to have a broader perspective when examining the needs of their individual communities.

The 2005 revision of the Data Book includes 2004 socio-economic information released by the Hawai'i Department of Human Services and the Department of Labor & Industrial Relations; and Health Statistics from the Department of Health's Office of Health Status Monitoring and Behavioral Risk Factor Surveillance System Program. This information provides a risk assessment for the 28 Primary Care Service Areas. Some of the demographic data used in this publication was 2000 U.S. Census data. Until we receive alternative data sources, we will have to rely on the census as our chief source of demographic data.

This year the Department is piloting two new health risk indexes; one for chronic disease, the other to define oral health risk.

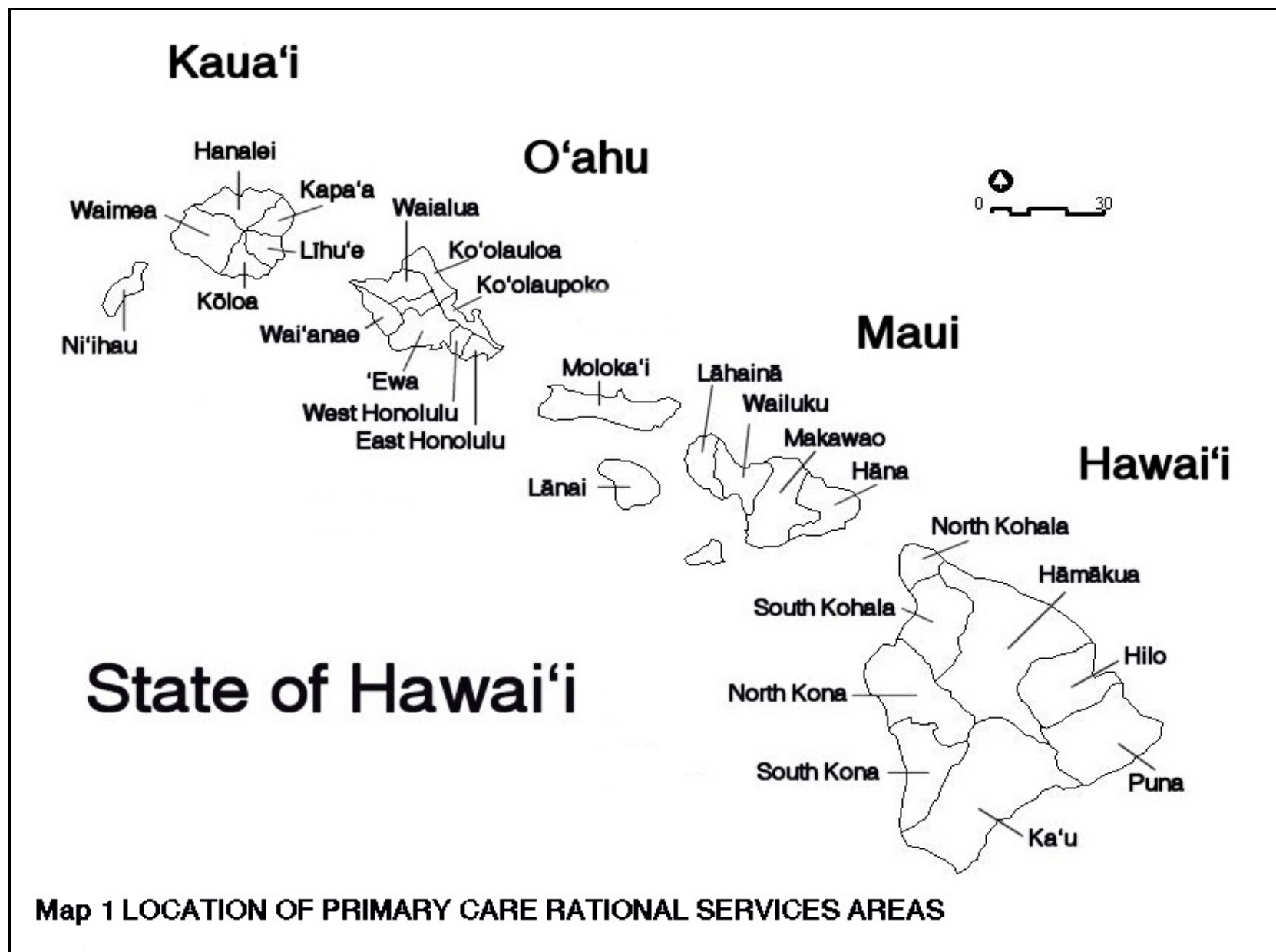
## Delineation of Service Areas

The rural health associations of the counties of Hawai'i, Maui and Kaua'i have delineated the *rational service areas* under their respective jurisdictions. The Needs Assessment Committee of the Primary Care Roundtable has participated in the delineation of *rational service areas* for the county of Honolulu.

Statistics are provided for the following 28 geographic areas that are considered rational service areas for the delivery of primary health services in the State of Hawai'i:

County	Service Area	Census Tract(s)
Honolulu City & County	East Honolulu . . . . .	1–45
	West Honolulu . . . . .	46–72
	'Ewa . . . . .	73–89
	Wahiawā . . . . .	90–95
	Wai'anae . . . . .	96–98
	Waialua . . . . .	99–100
	Ko'olau Loa . . . . .	101–102
	Ko'olau Poko . . . . .	103–113

County	Service Area	Census Tract(s)
Hawai'i County	Hilo . . . . .	201–209
	Puna . . . . .	210–211
	Ka'ū . . . . .	212
	South Kona . . . . .	213–214
	North Kona . . . . .	215–216
	South Kohala . . . . .	217
	North Kohala . . . . .	218
	Hāmākua . . . . .	219–221
Maui County	Hāna . . . . .	301
	Makawao . . . . .	302–305
	Wailuku . . . . .	306–313
	Lāhainā . . . . .	314–315
	Lāna'i . . . . .	316
	Moloka'i w/o Kalawao . . . . .	317–318
Kaua'i County	Hanalei . . . . .	401
	Kapa'a . . . . .	402–403
	Līhu'e . . . . .	404–405
	Kōloa . . . . .	406–407
	Waimea . . . . .	408–409
	Ni'ihau . . . . .	410





## CHAPTER 2 PRIMARY CARE ACCESS INDICATORS

This section contains a discussion of the indicators chosen to develop an assessment of primary care access for our communities as well as the limitations of this approach to small area planning.

### Categories of Data

Data was collected from both public documents and from unpublished files by several government agencies, namely: the United States Bureau of the Census, for demographic data from the 2000 census; the Hawai'i Department of Health, Office of Health Status Monitoring, for vital statistics data, the Behavioral Risk Factor Surveillance System Program, for adult risk factor data; the Hawai'i Department of Labor and Industrial Relations, Research and Statistics Office, for labor market statistics; and the Hawai'i Department of Human Services, Information Systems Office, for financial assistance data. This data was then classified into three different types of indicators, showing *population demographic status, health status, and socio-economic status*.

### Data Limitations and Interpretation

#### Comparison and Ranking of Service Areas

The 28 service areas are unweighted with respect to population, i.e. they are treated equally regardless of the absolute size of the population in the area. This is to avoid the bias towards areas with extremely large population sizes, e.g., East and West Honolulu relative to Hāna or Ka'u. Also, the ranking of service areas is unweighted with respect to the variables, i.e., the standardized scores for each of the indicators are simply added up to arrive at a composite index. It must be noted that the ranking is based on only a few selected indicators and that any changes to these variables may also affect the ranking. Finally, it must be emphasized that the numbers should be interpreted as **relative** rather than as absolute measures of risk.

#### Notes on Confidence Intervals

In order to assess whether a particular community's rate on a health status indicator is significantly different from some baseline rate or from the county or state average, it is necessary to make comparisons of the rates. But simply looking at the rates and determining which is higher or lower may not be meaningful when the *small numbers problem* exists. Random fluctuations occur on a year-to-year basis in the number of deaths that occur in a community, apart from the real changes in mortality rates due to epidemics, poor access to care, etc. In areas with a very small population and very small number of deaths, these fluctuations can produce large changes in mortality rates from year to year. This certain amount of variation between rates that can be expected due to chance and is not indicative of true changes occurring in the population is referred to as *random variation*. One way of interpreting the magnitude of random variation between rates is by using *confidence intervals*.

The confidence interval calculated for a particular service area rate indicates the expected range of random variation in the estimate. Suppose the service area rate is being compared to

the state rate. If the confidence interval for the state rate overlaps the calculated confidence interval for the service area, it can be inferred that the difference between the rates is probably due to random fluctuation (or chance) and there is probably no meaningful difference between the rates. On the other hand, if there is no overlap, it can be concluded that the difference between the rates is meaningful or statistically significant. The smaller the denominator used to calculate the rate for a particular service area, the larger the random fluctuation in the estimate, and the more likely that there may not actually be a meaningful difference between the rates. This is important to bear in mind during the comparison and interpretation of the rates.

An example of the use of confidence intervals<sup>1</sup> is as follows:

	Infant Mortality Rate	Number of Deaths	Number of Live Births
STATE	6.9	731	105,823
Service Area X	6.8	179	26,186
Service Area Y	4.7	47	9,897

	95% Confidence Interval	
	Lower Limit	Upper Limit
STATE	6.4	7.4
Service Area X	5.8	7.8
Service Area Y	3.4	6.1

Since the confidence interval for the state overlaps the confidence interval for service area X, it can be concluded that service area X's infant mortality rate is not meaningfully different from the state rate. On the other hand, service area Y's infant mortality rate of 4.7 can be said to be significantly lower than the state rate since the confidence interval calculated for service area Y does not overlap with the confidence interval for the state. While confidence intervals are not a rigorous test of significance, they provide a reasonable guide to the interpretation of the magnitude of the random fluctuations in the difference between rates.

### The Small Numbers Problem

The small numbers problem is a result of a small at-risk population. While there are clear advantages to using rates as a measure of frequency, there is a major limitation when the number of events (e.g., births, population) in the denominator is very small. To reduce this problem, data for six years was aggregated, whenever possible. However, even with such aggregation, the events number very few for some service areas. It is therefore advised that considerable caution be exercised in the interpretation of these rates, particularly in making comparisons. For example, in cases when the numerator of a multiple year period refers to a very small number of events (fewer than 20), the confidence interval is often too wide to make meaningful comparisons. In these instances a standardized ratio can be computed instead of a confidence interval. A standardized ratio is the relationship between the observed number of

---

<sup>1</sup> *Lower limit* =  $p - 1.96 * \sqrt{pq/n}$ . *Upper limit* =  $p + 1.96 * \sqrt{pq/n}$ .  $p$  is the area rate.  $n$  is the number of births in the area.  $q$  is  $1 - p$ .

events versus the expected number of events. To calculate the expected number of events, state rates are applied to the area denominator to generate an expected number of events if the area rate was the same as the state rate. The equation for the expected number of events is:

$$\text{Area Denominator} \times \text{State Rate} = \text{Expected Number of Events}$$

A standardized ratio can then be calculated by dividing the observed number of events by the expected number and multiplying by 100. When the standardized ratio is greater than 200, your area may have a rate that is significantly higher than the state.

## Primary Care Access Indicators

This section contains definitions for the types of indicators related to primary care access, with tables and charts for each indicator described.

## Population Status

The population status indicators are defined as follows:

$$\text{Elderly Population} = \frac{\text{Number of persons age 65 years and over}}{\text{Total population}} \times 100$$

$$\text{Children and Youth Population} = \frac{\text{Number of persons age 17 and below}}{\text{Total population}} \times 100$$

$$\text{Birth Rate for Adult Women} = \frac{\text{Number of births to women age 18 to 44}}{\text{Total number of women age 18 to 44}} \times 100$$

$$\text{Resident Population} = \text{Number of persons in each service area}$$

$$\text{Native Hawaiian population} = \text{Number of persons who have identified themselves as Native Hawaiian}$$

$$\text{Percentage of Native Hawaiians} = \frac{\text{Number of Native Hawaiians in each service area}}{\text{Total number of persons in each service area}} \times 100$$

## Hawaiian Population Figures Update from the U.S. Census Bureau

Due to the growing changes in the racial and ethnic makeup of the country and in order to collect data that would better reflect the diversity of the country's population, the U.S. Census Bureau modified the way they collected race data in the 2000 Census. Respondents were allowed to identify one or more races to indicate their racial identity. There were 15 check box response categories and three write-in areas on the Census 2000 questionnaire, compared with 16 check box response categories and two write-in areas for the 1990 Census. Consequently, data on race from the 2000 Census are not directly comparable with those from the 1990 Census and previous censuses due, in part, by allowing respondents the option to report more than one race. Due to the change, data on race can be presented using several different options. One option provides data about people who reported a race either "alone" or in "combination with one or more other races."

The 2000 Census reports that there were 80,137 people in the State of Hawai'i who identified themselves as "Native Hawaiian." This dataset reports only those residents who identified themselves as "Native Hawaiian" and did not indicate more than one race.

### 2000 U.S. Census Population Report:

#### Native Hawaiian Alone

	State of Hawai'i	Hawai'i County	City & County of Honolulu	Kaua'i County	Maui County
Total	80,137	14,461	49,267	4,935	11,410

Of the Native Hawaiian population living in Hawai'i, there were 239,655 who were identified as Hawaiian or part-Hawaiian. These numbers are listed below, as well as in chart form (see Chart 5 on page 13). These numbers are more indicative of the Native Hawaiian people living in the state of Hawai'i.

#### Native Hawaiian alone or in any combination with one or more of the other races

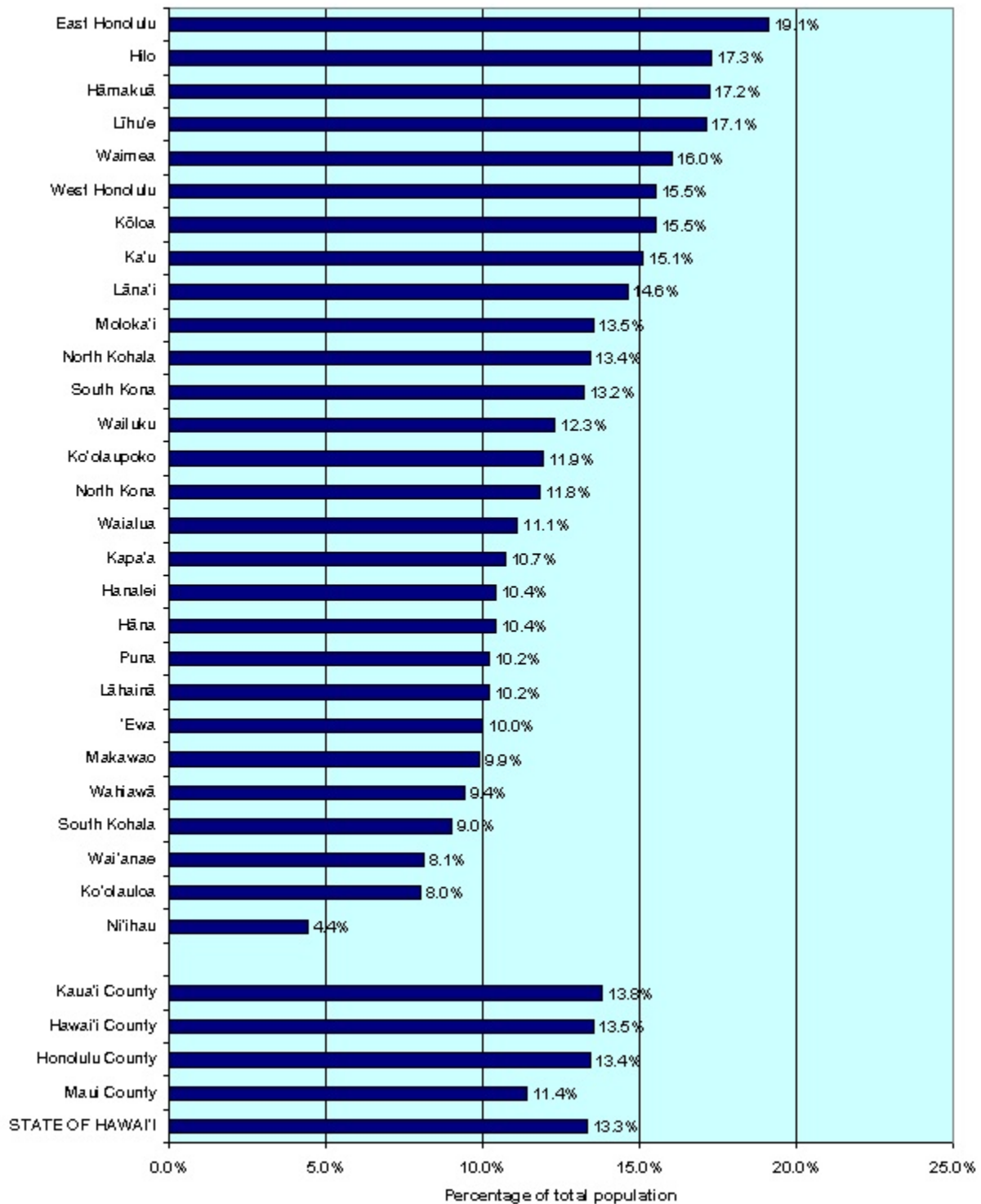
	State of Hawai'i	Hawai'i County	City & County of Honolulu	Kaua'i County	Maui County
Total	239,655	43,010	153,117	13,511	29,952

The U.S. Census Bureau who track the Native Hawaiian Population statewide released additional analysis of its 2000 census data. U.S. Census Bureau's Summary File 2 (SF2) provides a more accurate representation of Native Hawaiians living in Hawai'i. It takes into account both Native Hawaiian and part-native Hawaiians living in Hawai'i.

\* The U.S. Census Bureau recognizes census tract 319, the residents of Kalaupapa, as Kalawao County and reports it among the more customarily known counties in the State. It is accepted practice in State of Hawai'i demographic data to include the Kalawao County data with Maui County. For purposes of our Data Book, Chart 5, page 13, we include this population within the Maui County service area.

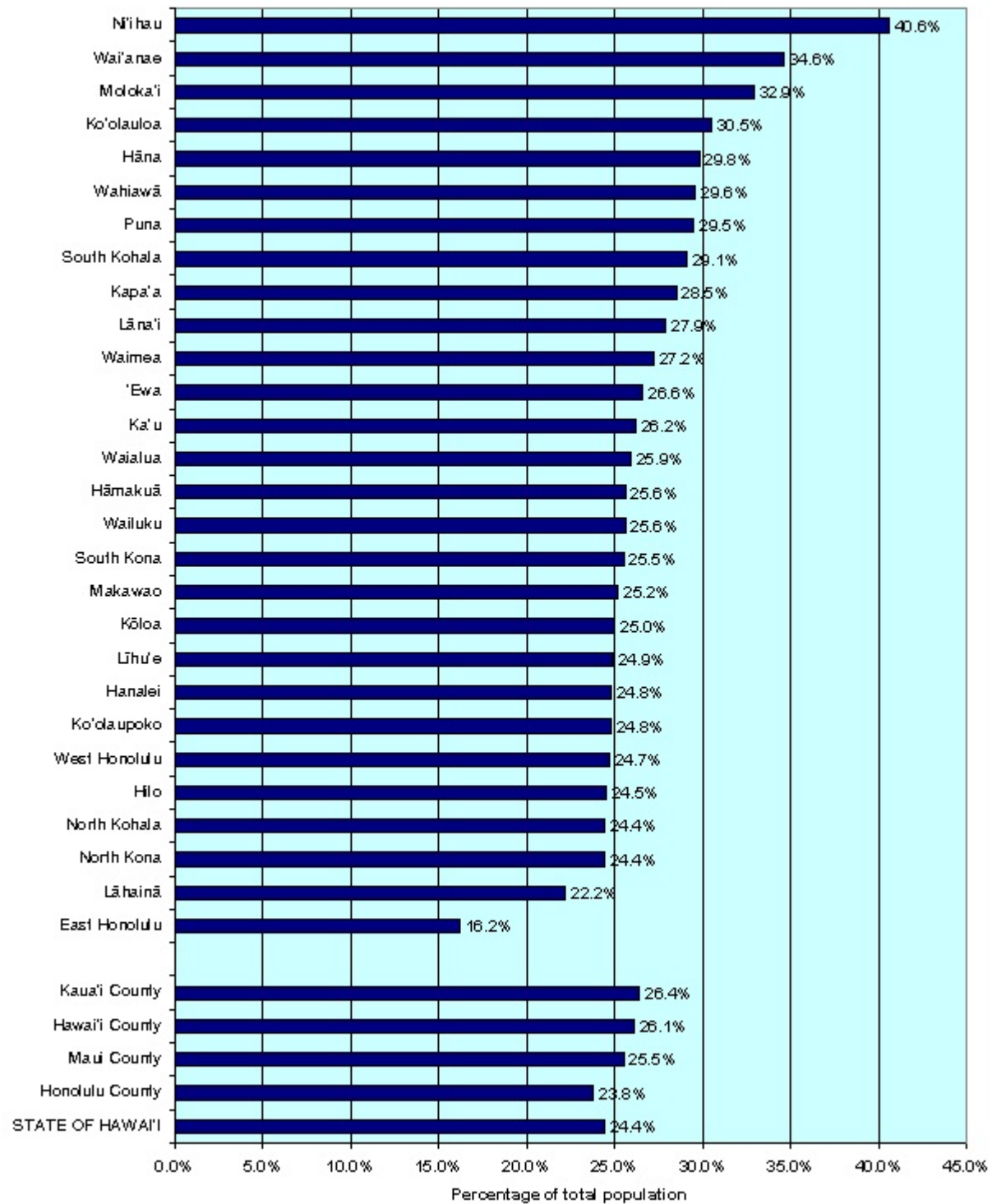


**Chart 1: PERCENTAGE OF POPULATION AGE 65 YEARS AND OVER, 2000**



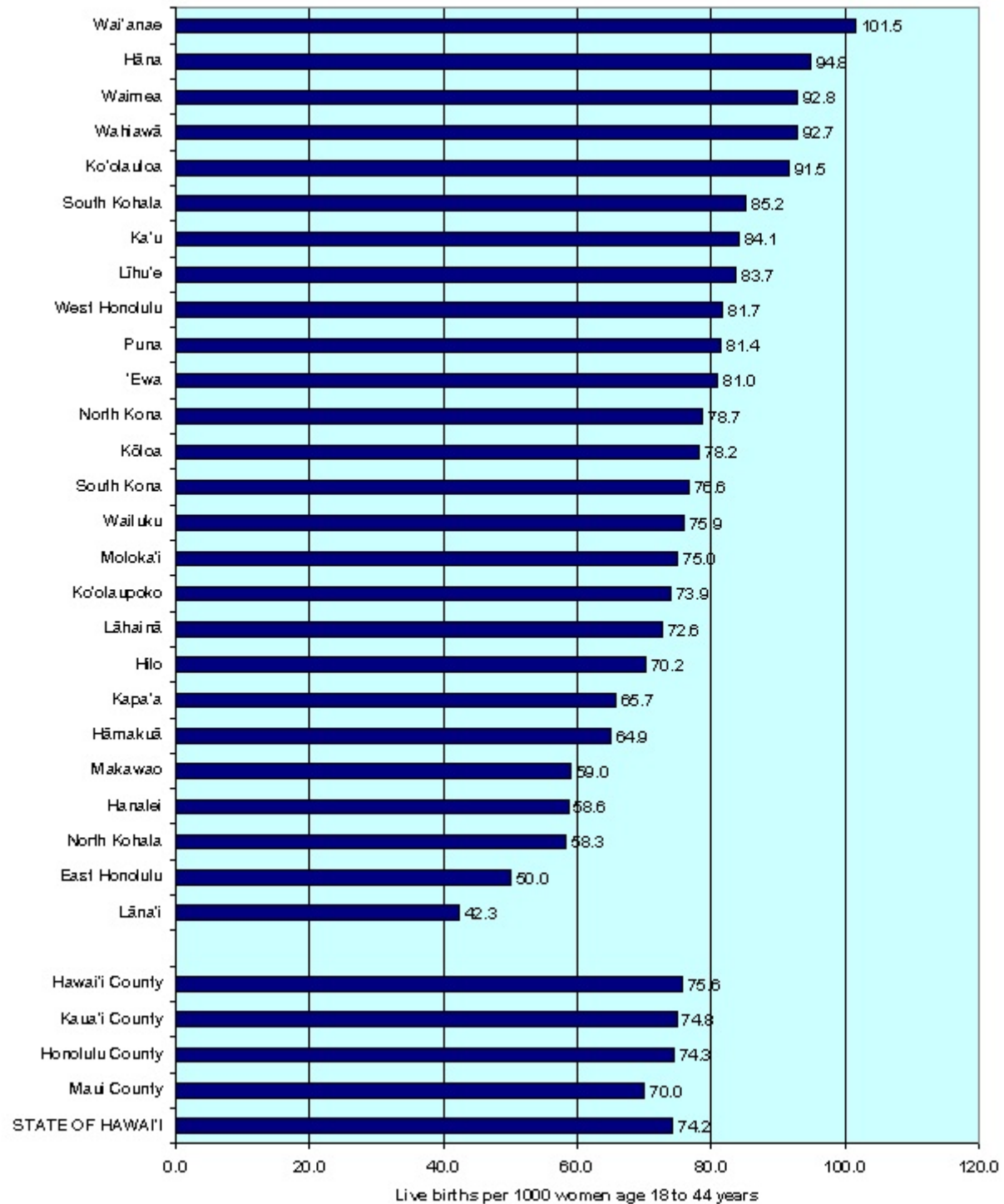
**Source:** U.S. Census Bureau, Census 2000.

**Chart 2: PERCENTAGE OF POPULATION AGE 17 AND BELOW, 2000**



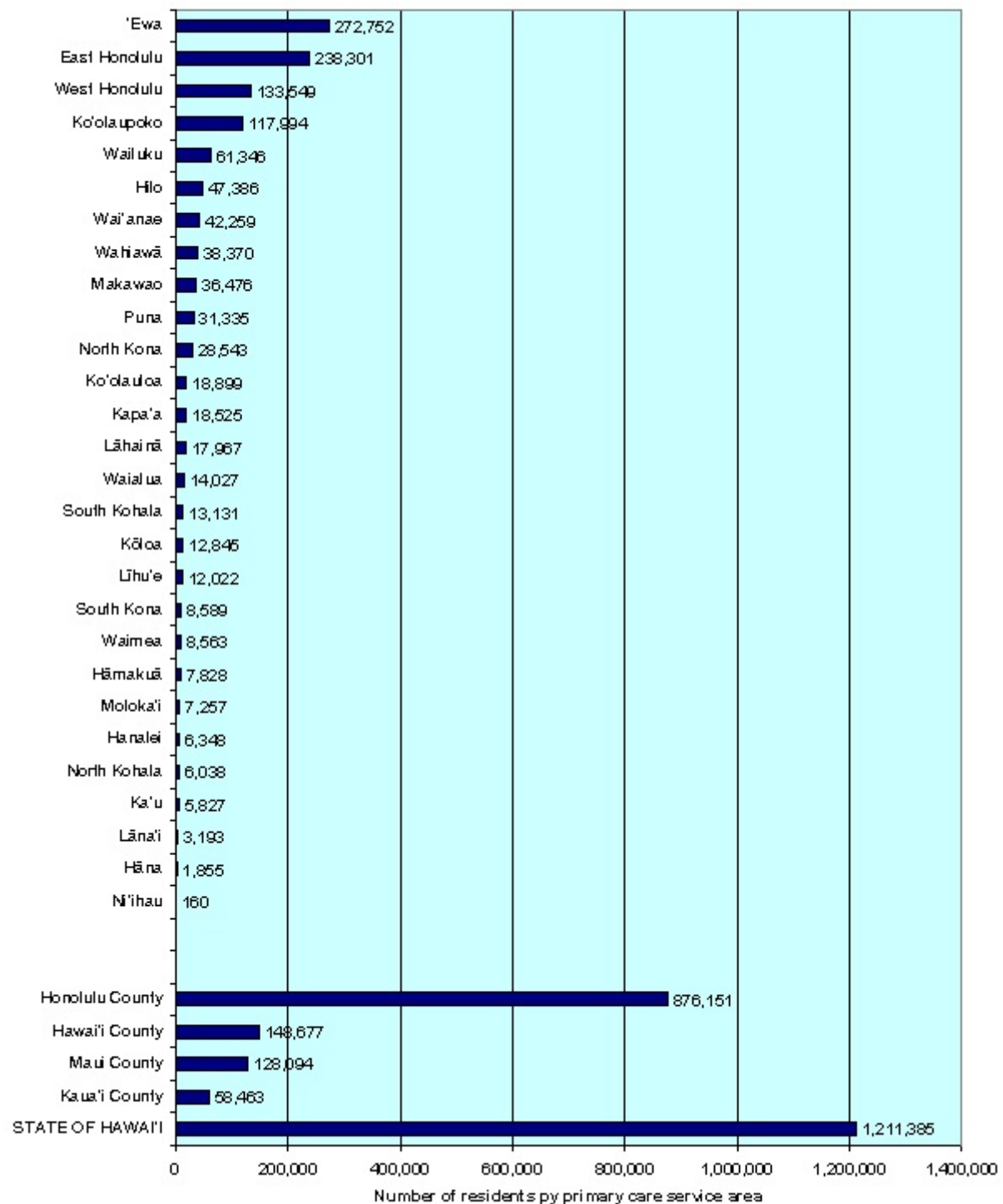
**Source:** U.S. Census Bureau, Census 2000.

**Chart 3: BIRTH RATE OF WOMEN AGE 18 TO 44 YEARS, 2004**



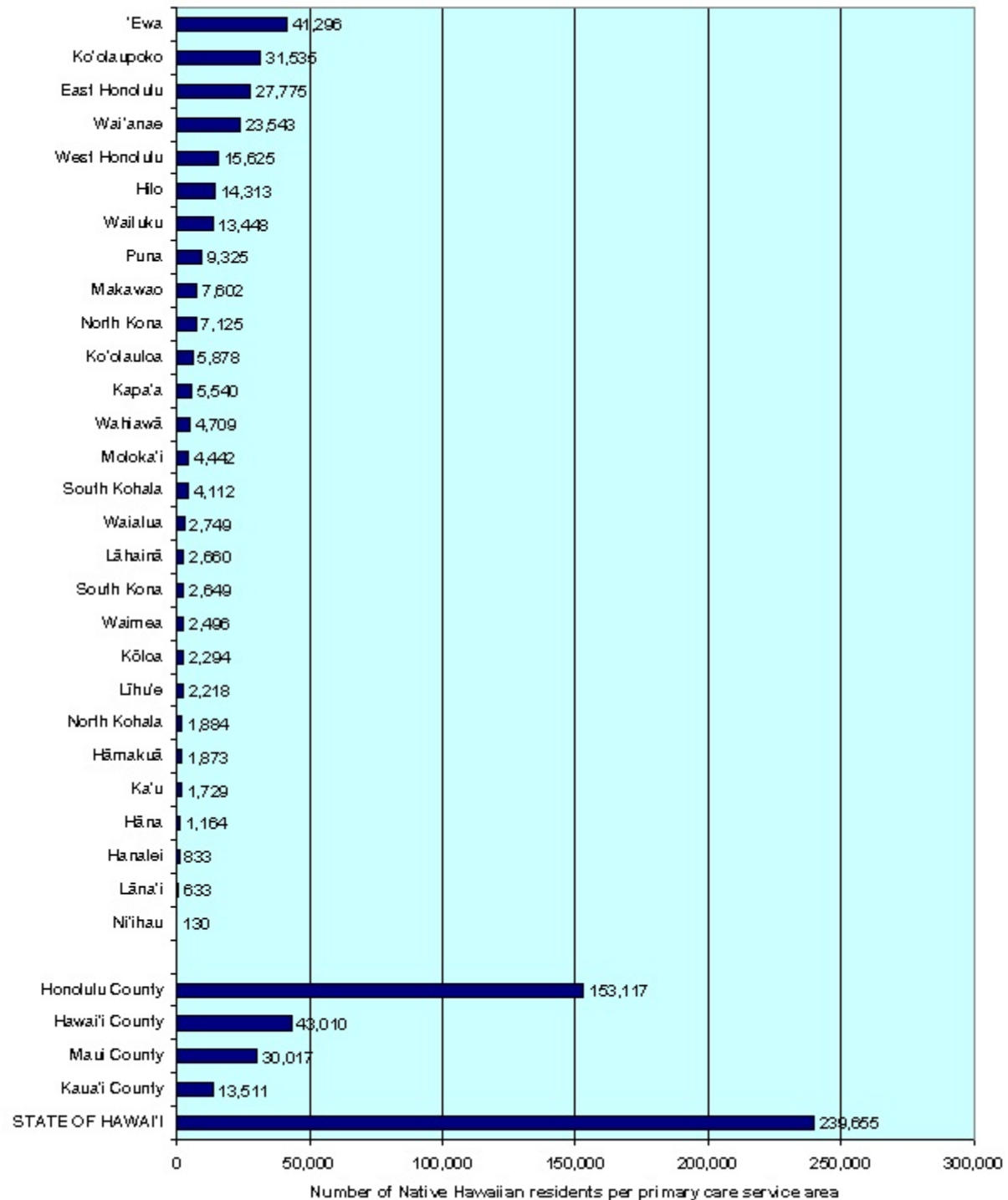
**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

**Chart 4: RESIDENT POPULATION BY SERVICE AREA, 2000**



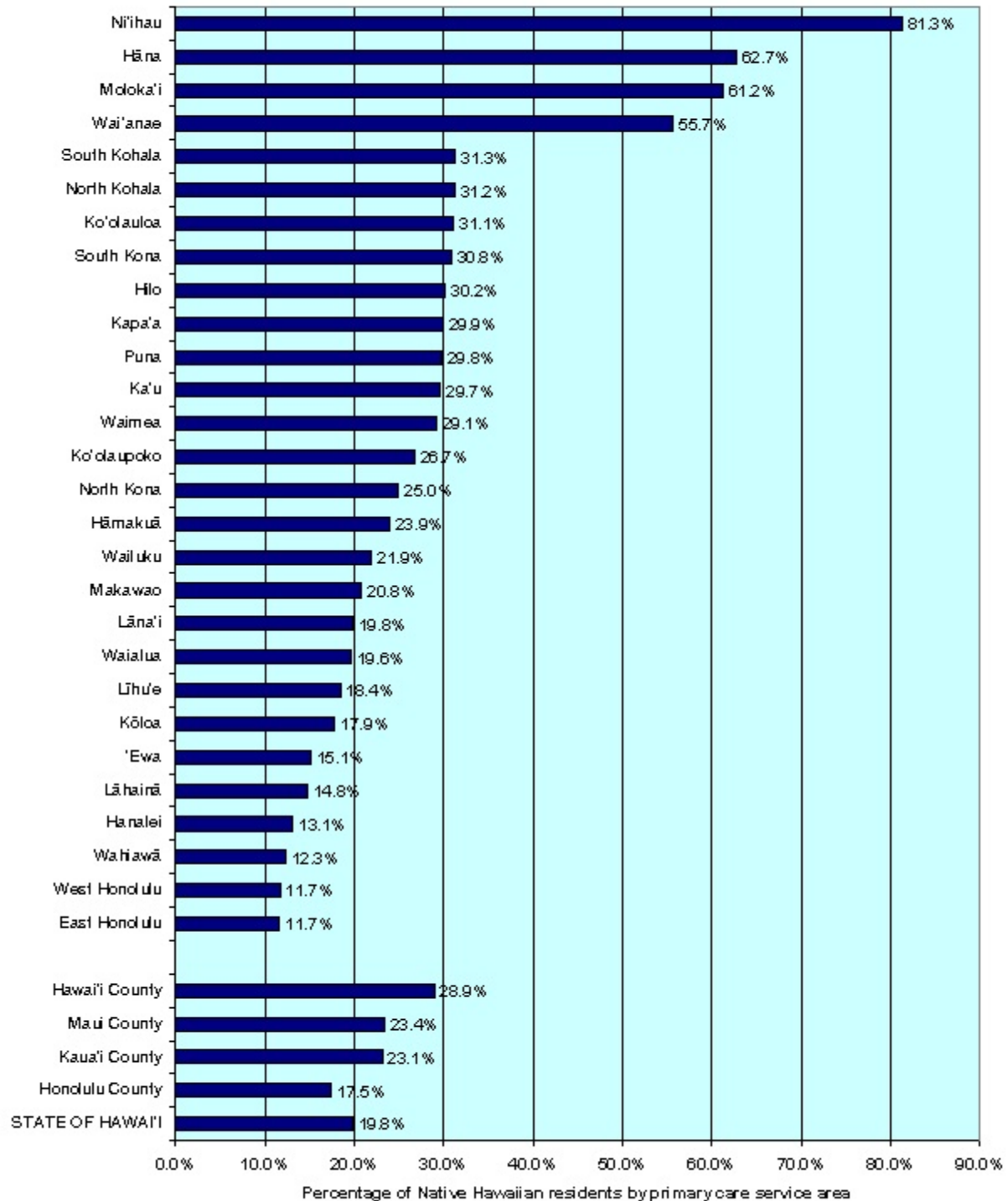
**Source:** U.S. Census Bureau, Census 2000.

**Chart 5: NATIVE HAWAIIAN POPULATION BY SERVICE AREA, 2000**



**Source:** U.S. Census Bureau, Census 2000.

**Chart 6: PERCENTAGE OF NATIVE HAWAIIANS BY SERVICE AREA, 2000**



**Source:** U.S. Census Bureau, Census 2000.

## Health Status

The health status indicators are defined as follows:

$$\text{Infant Mortality Rate (IMR)} = \frac{\text{Number of infant deaths}}{\text{Total number of live births}} \times 1,000$$

$$\text{Less than Adequate Prenatal Care Utilization}^* = \frac{\text{Number of births to mothers who received less than adequate prenatal care as measured by the Adequacy of Prenatal Care Utilization Index}}{\text{Total number of live births}} \times 100$$

$$\text{Low Birth Weight (LBW) Birth Rate} = \frac{\text{Number of low birthweight births (under 2,500 grams)}}{\text{Total number of live births}} \times 100$$

$$\text{Teen Birth Rate} = \frac{\text{Number of births to mothers age 17 years and younger}}{\text{Total number of live births}} \times 100$$

### \* Less than Adequate Prenatal Care Utilization

Prenatal care which is defined by a score of either “inadequate,” or “intermediate” as calculated by the Adequacy of Prenatal Care Utilization (APNCU) Index. The APNCU is a measure of prenatal care utilization which combines the month of pregnancy prenatal care begun with the number of prenatal visits. Rates are classified as “adequate plus,” “adequate,” “intermediate,” or “inadequate.”

Traditionally, the time of initiation for prenatal care utilization was used to determine the adequacy of prenatal care. Adequacy of prenatal care is determined by the month or trimester of the first prenatal care visit, generally first trimester. This measure provides information on the time a woman entered the health care system, but it does not provide information on the degree of prenatal care usage. This measure is based on the assumption that those women who entered prenatal care early in their pregnancy are exposed to the greater potential of access to prenatal care and thus probably receive adequate prenatal care. The general interpretation of this measure is that those who enter prenatal care during the first trimester of pregnancy receive adequate prenatal care. Despite the short comings, the first trimester entry measure is the most commonly used method by local, state, and national agencies to determine the adequacy of prenatal care utilization. This measure is the required reporting measurement methodology for many federal reports on prenatal care. It is also the standard reporting measurement tool used by the Hawai'i State Department of Health for decades

In 1994, Milton Kotelchuck proposed the Adequacy of Prenatal Utilization Index (APNCU), more commonly referred to as the “Kotelchuck Index.” The APNCU Index combines two separate indices: the “adequacy of initiation of prenatal care,” information on the adequacy of initiation of prenatal care (month care began) and the “adequacy of received services,” (number of visits based on gestational age of the child) to characterize adequacy of pregnancy-related health services provided to an expectant mother between conception and delivery. The APNCU Index compares the number of prenatal care visits to the number of expected visits, which is derived from the complete American College of Obstetricians and Gynecologist (ACOG) visitation standards across all gestational ages. The recommended number of visits is then adjusted according to gestational age. A ratio of actual/expected visits is calculated. The APNCU Index is a sum of these two indices: adequacy of initiation and adequacy of received services.

The Adequacy of Prenatal Utilization Index offers a more accurate and comprehensive set of measures of prenatal care utilization. The APNCU Index is the prenatal care utilization index now being actively supported by the Maternal and Child Health Bureau (MCHB), DHHS. Consequently, it is the index which the Family Health Services Division (FHSD) and other Title-V agencies are now required to use in their reporting.

A discussion of the APNCU has been published by, Milton Kotelchuck, “An Evaluation of the Kessner Adequacy of Prenatal Care Index and a Proposed Adequacy of Prenatal Care Utilization Index.” *American Journal of Public Health*. vol. 84. no. 9. (September 1994): pp. 1414-1420.

## **Vital Statistics Data**

The tabulations for Chart 7 through Chart 10 were based on data from the Office of Health Status Monitoring, Hawai'i Department of Health, Birth Certificate data.

The Birth Certificate data includes characteristics about the infant such as date of birth, age, gender, race/ethnicity, place of birth, birthweight, weeks of gestation; and demographic information about the parents such as age, race/ethnicity, marital status, maternal and paternal education, place of residence; medical and health information such as prenatal care, number of prenatal visits, method of delivery, congenital anomalies, medical risks, obstetric procedures, complications.

The Family Health Services Division in collaboration with the Office of Health Status Monitoring have implemented a comprehensive statewide birth certificate data quality improvement initiative. Specifications for collecting and editing the certificates of birth were implemented, written policies and procedures concerning the recording and reporting of birth certificate data were established, standardized statewide training for health care personnel who have the responsibility of recording and reporting of birth certificate data are conducted annually. Data quality procedures include range of value checks, internal consistency edits, mandatory data entry fields, and checks for consistency in trends over time. These efforts have been done to ensure the reliability and validity of the data.



## **Healthy People 2010**

In Charts 7 through 9, the Healthy People 2010 objectives for infant mortality rate, inadequate prenatal care birth rate, and low birth rate were included in our bar graph analysis. These were taken from the U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2010*.

*Healthy People 2010* profiles the Nation's health objectives. It identifies objectives to improve the Nation's health, and sets measurable targets to monitor progress toward its goals. There are 467 objectives in 28 focus areas.

## **Changes to 2005 Edition**

In earlier editions of the *Primary Care Needs Assessment Data Book*, there was a category named "Reported Medical Risk Birth Rate" reported. The category was removed from this edition due to issues concerning its appropriateness and its validity as an assessment tool.

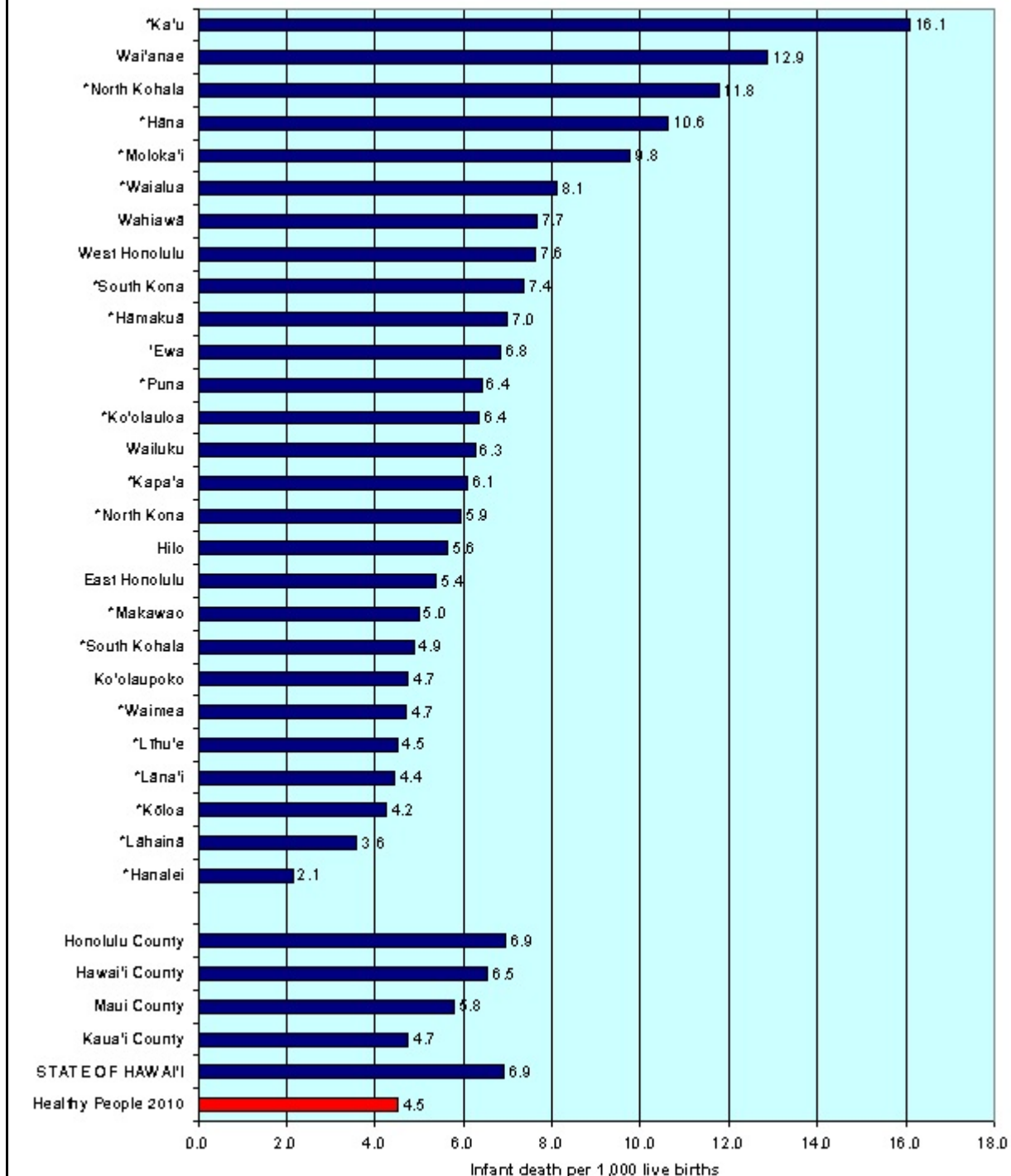
**Table 1: INFANT MORTALITY, 1999-2004**

Service Area	Number of Live Births	Number of Infant Deaths	Infant Mortality Rate *	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	105,823	731	6.9	6.41	7.41
<b>Honolulu</b>	77,412	537	6.9	6.35	7.52
East Honolulu	13,935	75	5.4	4.17	6.60
West Honolulu	12,972	99	7.6	6.13	9.13
'Ewa	26,186	179	6.8	5.84	7.83
Wahiawā	5,094	39	7.7	5.26	10.05
Wai'anae	5,277	68	12.9	9.84	15.93
Waialua	1,728	14	8.1	—	—
Ko'olaupoko	2,203	14	6.4	—	—
Ko'olaupoko	9,897	47	4.7	3.39	6.10
<b>Hawai'i</b>	12,222	80	6.5	5.12	7.98
Hilo	3,721	21	5.6	3.24	8.05
Puna	2,653	17	6.4	—	—
Ka'u	435	7	16.1	—	—
South Kona	815	6	7.4	—	—
North Kona	2,355	14	5.9	—	—
South Kohala	1,232	6	4.9	—	—
North Kohala	425	5	11.8	—	—
Hāmākua	573	4	7.0	—	—
<b>Maui</b>	11,065	64	5.8	4.37	7.20
Hāna	188	2	10.6	—	—
Makawao	2,609	13	5.0	—	—
Wailuku	5,754	36	6.3	4.22	8.29
Lāhainā	1,670	6	3.6	—	—
Lāna'i	226	1	4.4	—	—
Moloka'i	614	6	9.8	—	—
<b>Kaua'i</b>	4,642	22	4.7	2.76	6.72
Hanalei	469	1	2.1	—	—
Kapa'a	1,479	9	6.1	—	—
Līhu'e	1,112	5	4.5	—	—
Kōloa	943	4	4.2	—	—
Waimea	637	3	4.7	—	—
Ni'ihau	0	0	0.0	—	—

**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than the standardized ratio of 200, implying that the rates were not significantly higher than those of the State of Hawai'i. See Family Health Outcomes project (FHOP), Guidelines for Using Federal Data Templates with Small Numbers (May 1, 1997). \* Some data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

Chart 7: INFANT MORTALITY RATE, 1999-2004



Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring.

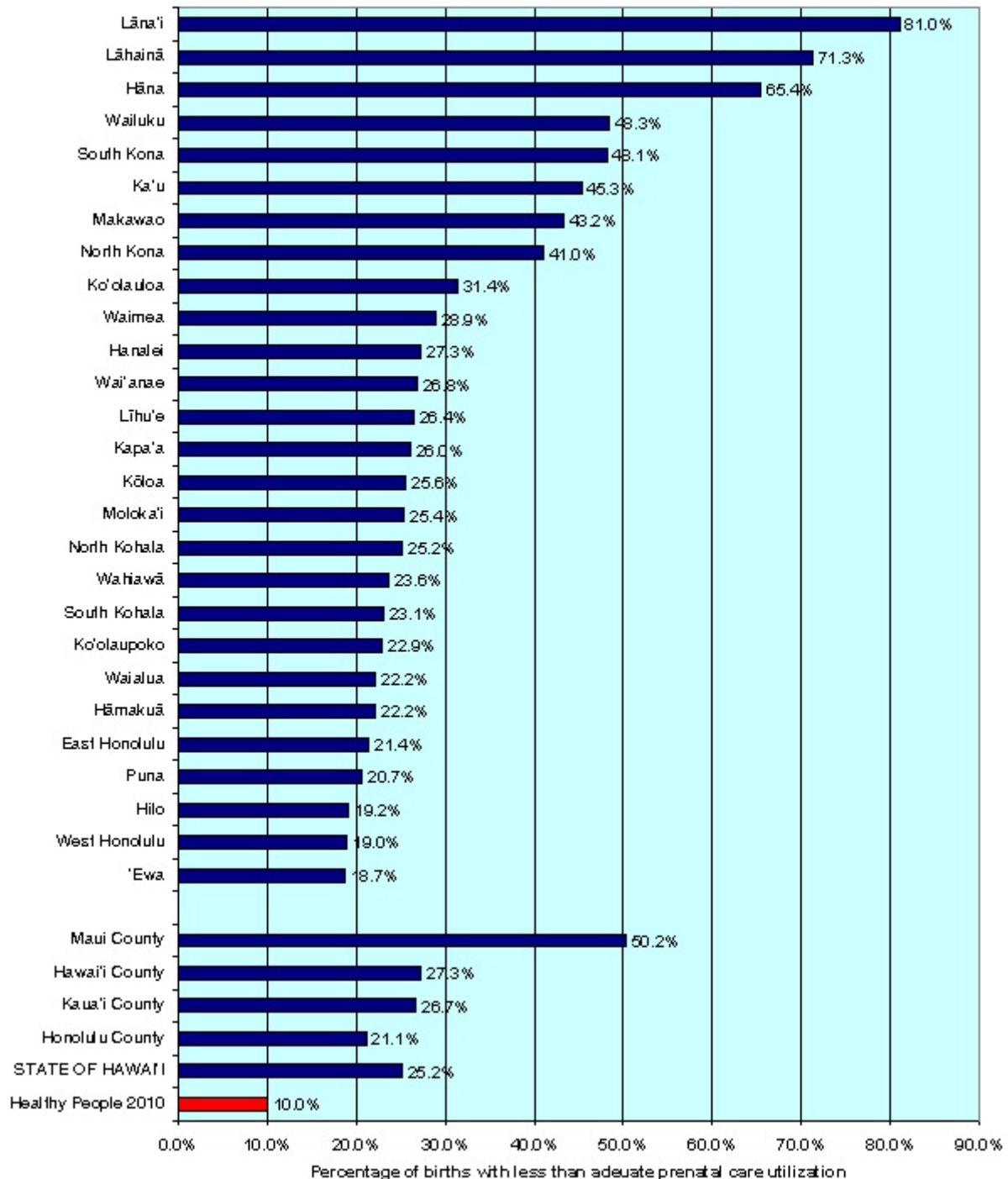
\* Some data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

**Table 2: LESS THAN ADEQUATE PRENATAL CARE UTILIZATION BIRTHS,  
1999-2004**

Service Area	Number of Live Births	Less than Adequate Prenatal Care Utilization Births	Percentage of Births with Less than Adequate Prenatal Care Utilization	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	105,823	26,622	25.2	24.90	25.42
<b>Honolulu</b>	77,412	16,342	21.1	20.82	21.40
East Honolulu	13,935	2,989	21.5	20.77	22.13
West Honolulu	12,972	2,459	19.0	18.28	19.63
'Ewa	26,186	4,900	18.7	18.24	19.18
Wahiawā	5,094	1,203	23.6	22.45	24.78
Wai'anae	5,277	1,416	26.8	25.64	28.03
Waialua	1,728	383	22.2	20.21	24.12
Ko'olauloa	2,203	691	31.4	29.43	33.30
Ko'olaupoko	9,897	2,268	22.9	22.09	23.74
<b>Hawai'i</b>	12,222	3,337	27.3	26.51	28.09
Hilo	3,721	713	19.2	17.90	20.43
Puna	2,653	548	20.7	19.12	22.20
Ka'u	435	197	45.3	40.61	49.97
South Kona	815	392	48.1	44.67	51.53
North Kona	2,355	965	41.0	38.99	42.96
South Kohala	1,232	284	23.1	20.70	25.40
North Kohala	425	107	25.2	21.05	29.30
Hāmākua	573	127	22.2	18.76	25.56
<b>Maui</b>	11,065	5,558	50.2	49.30	51.16
Hāna	188	123	65.4	58.63	72.22
Makawao	2,609	1,128	43.2	41.33	45.14
Wailuku	5,754	2,782	48.3	47.06	49.64
Lāhainā	1,670	1,190	71.3	69.09	73.43
Lāna'i	226	183	81.0	75.86	86.09
Moloka'i	614	156	25.4	21.96	28.85
<b>Kaua'i</b>	4,642	1,239	26.7	25.42	27.96
Hanalei	469	128	27.3	23.26	31.32
Kapa'a	1,479	385	26.0	23.79	28.27
Līhu'e	1,112	294	26.4	23.85	29.03
Kōloa	943	241	25.6	22.77	28.34
Waimea	637	184	28.9	25.37	32.41
Ni'ihau	0	0	0.0	—	—

**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

**Chart 8: PERCENTAGE OF BIRTHS WITH LESS THAN ADEQUATE  
PRENATAL CARE UTILIZATION, 1999-2004**



**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

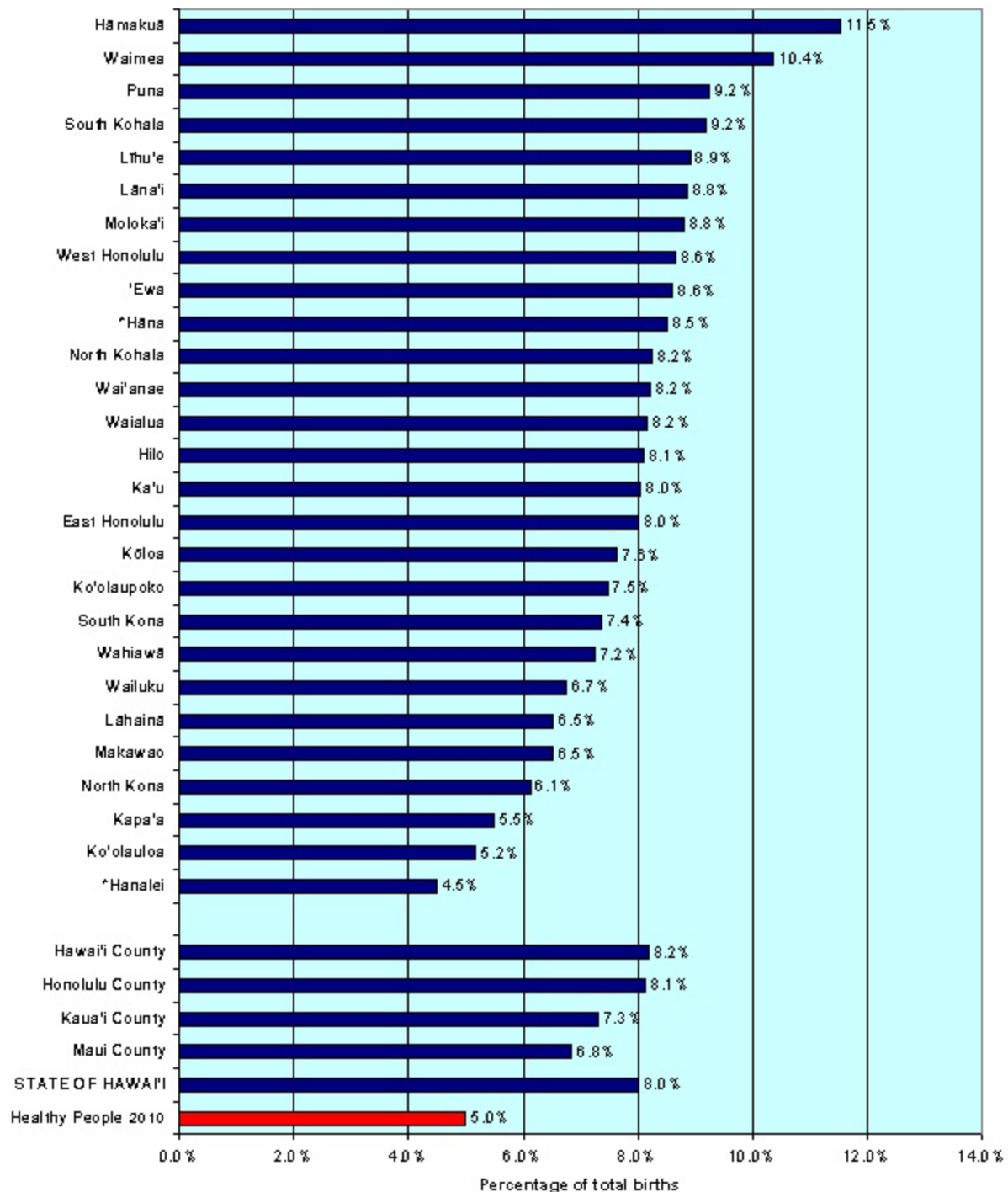
**Table 3: LOW BIRTH WEIGHT, 1999-2004**

Service Area	Number of Live Births	Number of Low Birth Weight Births	Percent of Low Birth Weight Births	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	105,823	8,470	8.0	7.84	8.17
<b>Honolulu</b>	77,412	6,296	8.1	7.69	8.33
East Honolulu	13,935	1,116	8.0	7.56	8.46
West Honolulu	12,972	1,121	8.6	8.16	9.13
'Ewa	26,186	2,253	8.6	8.26	8.94
Wahiawā	5,094	369	7.2	6.53	7.96
Wai'anae	5,277	433	8.2	7.46	8.95
Waialua	1,728	141	8.2	6.87	9.45
Ko'olaupoko	2,203	114	5.2	4.25	6.10
Ko'olaupoko	9,897	739	7.5	6.95	7.98
<b>Hawai'i</b>	12,222	999	8.2	7.69	8.66
Hilo	3,721	301	8.1	7.21	8.97
Puna	2,653	245	9.2	8.13	10.34
Ka'u	435	35	8.0	5.49	10.60
South Kona	815	60	7.4	5.57	9.15
North Kona	2,355	144	6.1	5.15	7.08
South Kohala	1,232	113	9.2	7.56	10.78
North Kohala	425	35	8.2	5.62	10.85
Hāmākua	573	66	11.5	8.90	14.13
<b>Maui</b>	11,065	757	6.8	6.37	7.31
Hāna	188	16	8.5	—	—
Makawao	2,609	170	6.5	5.57	7.46
Wailuku	5,754	388	6.7	6.10	7.39
Lāhainā	1,670	109	6.5	5.34	7.71
Lāna'i	226	20	8.9	5.15	12.55
Moloka'i	614	54	8.8	6.55	11.04
<b>Kaua'i</b>	4,642	339	7.3	6.55	8.05
Hanalei	457	15	3.3	—	—
Kapa'a	1,481	86	5.8	4.62	7.00
Līhu'e	1,054	90	8.5	6.85	10.23
Kōloa	894	71	7.9	6.17	9.71
Waimea	632	70	11.1	8.63	13.52
Ni'ihau	0	0	0.0	—	—

**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than the standardized ratio of 200, implying that the rates were not significantly higher than those of the State of Hawai'i. See Family Health Outcomes project (FHOP), Guidelines for Using Federal Data Templates with Small Numbers (May 1, 1997).

**Chart 9: PERCENTAGE OF BIRTHS WITH LOW BIRTH WEIGHT, 1999-2004**



**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

\* Some data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

**Table 4: BIRTHS TO TEENS AGED 10 TO 17 YEARS, 1999-2004**

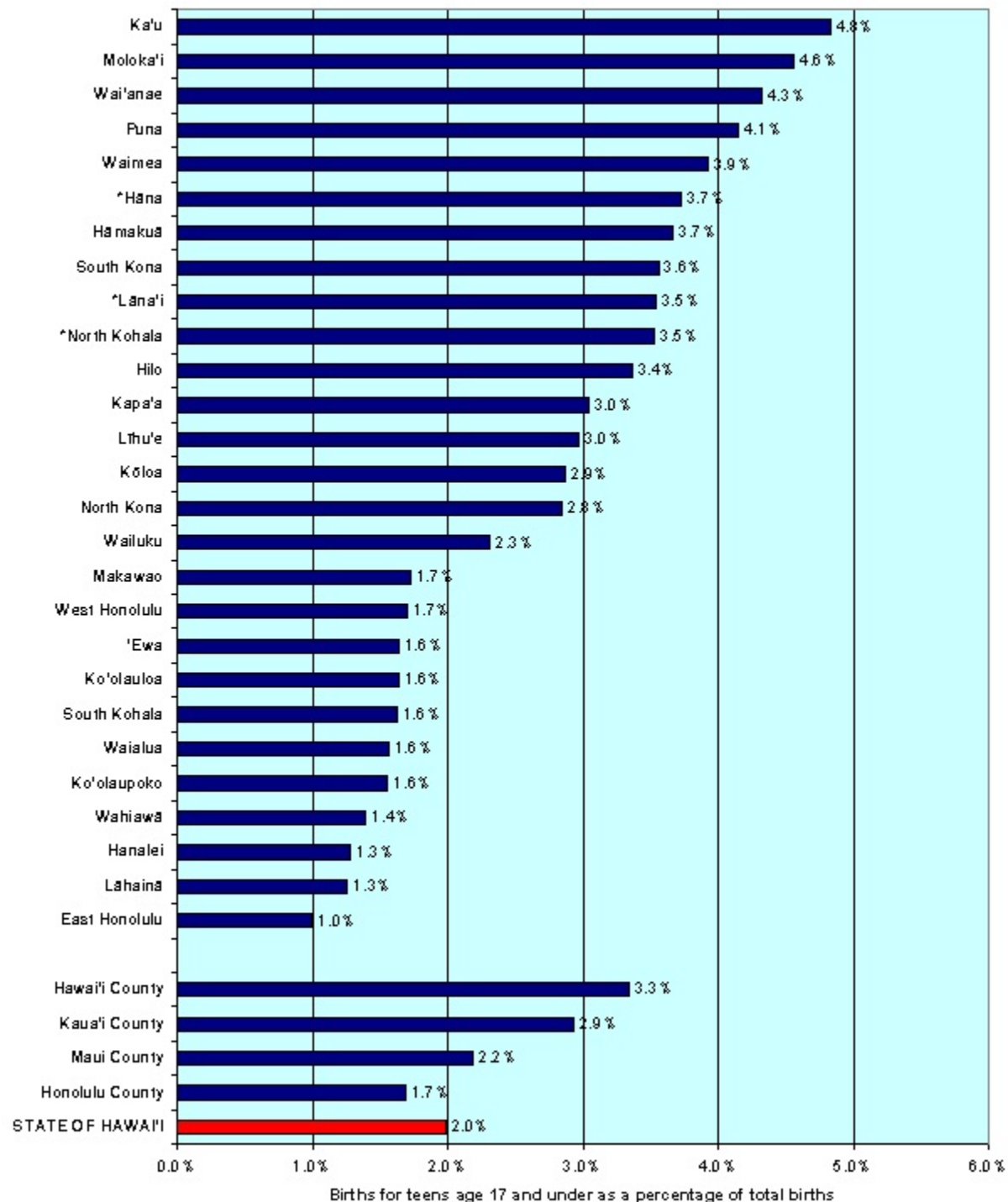
Service Area	Number of Live Births	Number of Births to Teens	Percentage of Births to Teens *	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	105,823	2,096	2.0	1.90	2.06
<b>Honolulu</b>	77,412	1,305	1.7	1.60	1.78
East Honolulu	13,935	139	1.0	0.83	1.16
West Honolulu	12,972	220	1.7	1.47	1.92
'Ewa	26,186	429	1.6	1.48	1.79
Wahiawā	5,094	71	1.4	1.07	1.72
Wai'anae	5,277	228	4.3	3.77	4.87
Waialua	1,728	27	1.6	0.98	2.15
Ko'olaupoko	2,203	36	1.6	1.10	2.16
Ko'olaupoko	9,897	154	1.6	1.31	1.80
<b>Hawai'i</b>	12,222	408	3.3	3.02	3.66
Hilo	3,721	125	3.4	2.78	3.94
Puna	2,653	110	4.1	3.39	4.90
Ka'u	435	21	4.8	2.81	6.84
South Kona	815	29	3.6	2.29	4.83
North Kona	2,355	67	2.8	2.17	3.52
South Kohala	1,232	20	1.6	0.92	2.33
North Kohala	425	15	3.5	—	—
Hāmākua	573	21	3.7	2.13	5.20
<b>Maui</b>	11,065	242	2.2	1.91	2.46
Hāna	188	7	3.7	—	—
Makawao	2,609	45	1.7	1.23	2.22
Wailuku	5,754	133	2.3	1.92	2.70
Lāhainā	1,670	21	1.3	0.72	1.79
Lāna'i	226	8	3.5	—	—
Moloka'i	614	28	4.6	2.91	6.21
<b>Kaua'i</b>	4,642	136	2.9	2.44	3.41
Hanalei	469	6	1.3	—	—
Kapa'a	1,479	45	3.0	2.17	3.92
Līhu'e	1,112	33	3.0	1.97	3.97
Kōloa	943	27	2.9	1.80	3.93
Waimea	637	25	3.9	2.42	5.43
Ni'ihau	0	0	0.0	—	—

**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than the standardized ratio of 200, implying that the rates were not significantly higher than those of the State of Hawai'i. See Family Health Outcomes project (FHOP), Guidelines for Using Federal Data Templates with Small Numbers (May 1, 1997). \* Some data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.



**Chart 10: PERCENTAGE OF TEEN BIRTHS\*, 1999-2004**



**Source:** State of Hawai'i, Department of Health, Office of Health Status Monitoring.

\* Same data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

## Socio-Economic Status

The socio-economic status indicators are defined as follows:

<b>Per Capita Income</b>	= Annual income (U.S. dollars) per person
--------------------------	---

<b>Percentage of Population Below 100% (or 200%) of Poverty</b>	= $\frac{\text{Number of persons with incomes below 100 percent(or 200 percent) of the federally-defined povertylevel}}{\text{Total population}} \times 100$
---	--

<b>Civilian Unemployment Rate</b>	= $\frac{\text{Number of persons unemployed}}{\text{Total civilian labor force}} \times 100$
---------------------------------------	--

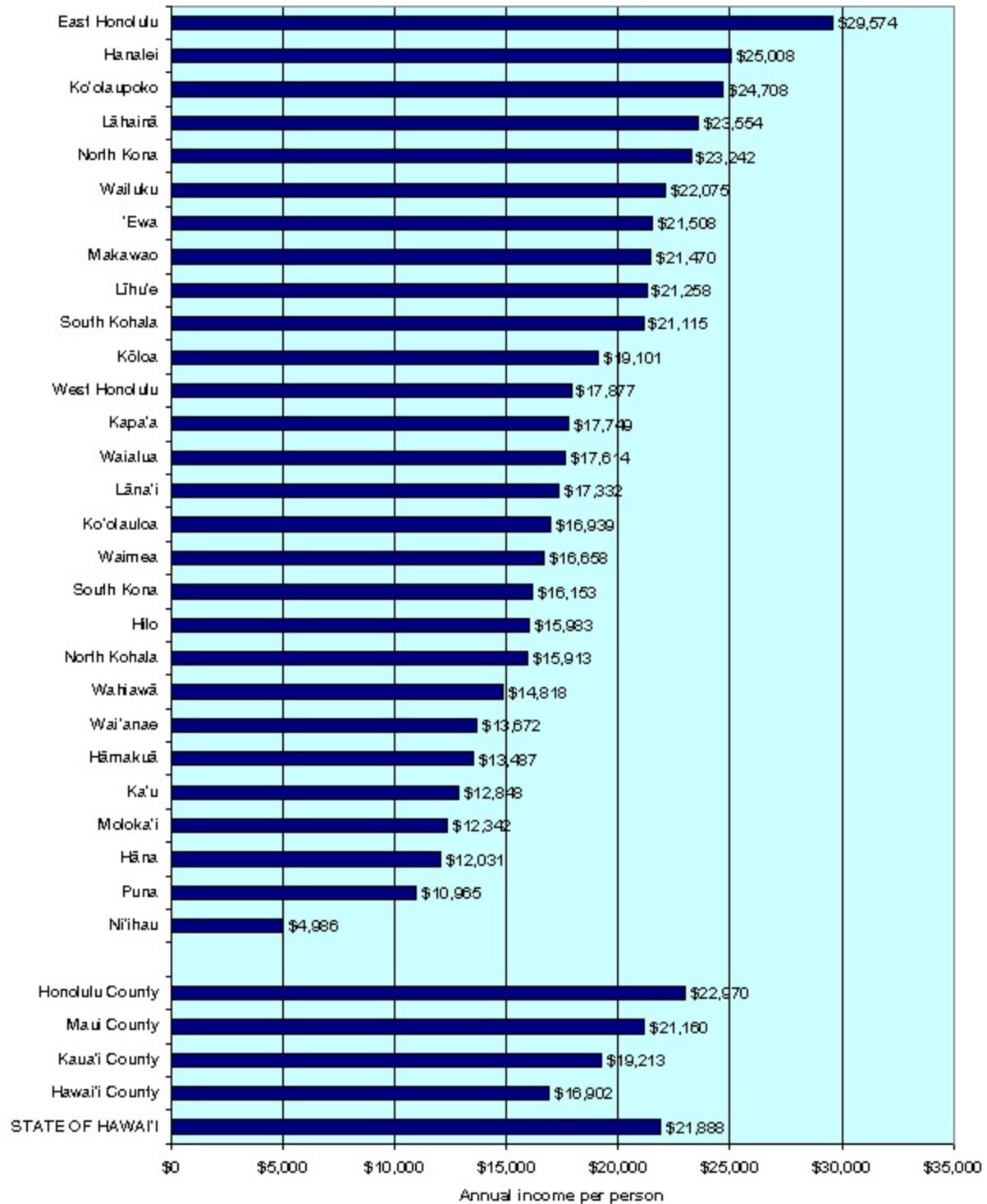
<b>Percentage of Adults without a High School Diploma</b>	= $\frac{\text{Number of persons 18 years and over with no highschool diploma}}{\text{Total population age 18 years and over}} \times 100$
---	--

<b>Percentage of Households Receiving Public Assistance</b>	= $\frac{\text{Number of households receiving financial aid underTemporary Assistance to Needy Families (TANF)}}{\text{Total number of households}} \times 100$
---	---

<b>Percentage of Households Receiving Food Stamps</b>	= $\frac{\text{Number of households receiving food stamps}}{\text{Total number of households}} \times 100$
---	--

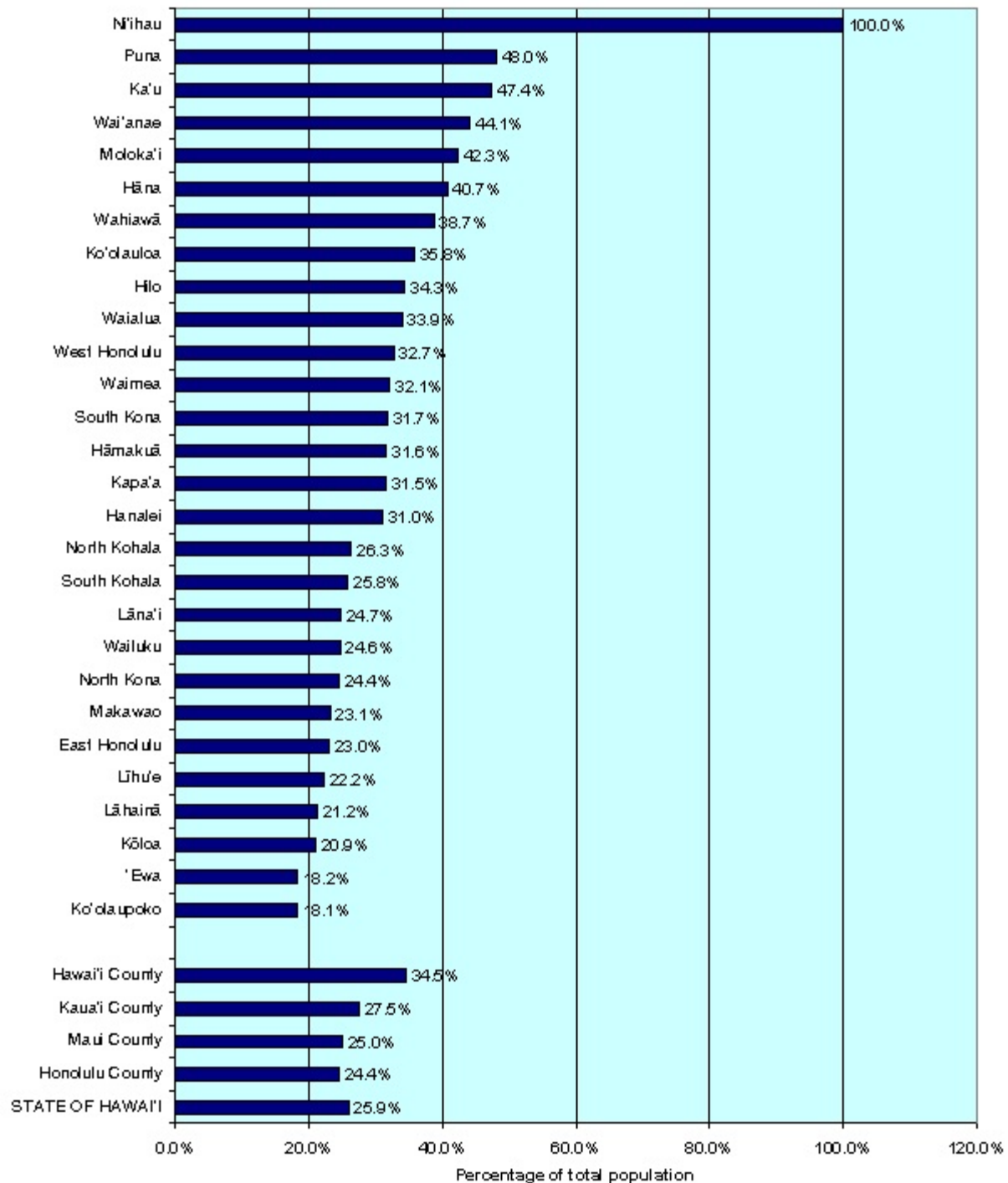
Data from the Research and Statistics Office, Hawai'i Department of Labor and Industrial Relations and the Information Systems Office, Hawai'i Department of Human Services were used for the socio-economic indicators shown in Chart 12 through Chart 18.

**Chart 11: PER CAPITA INCOME, 1998**



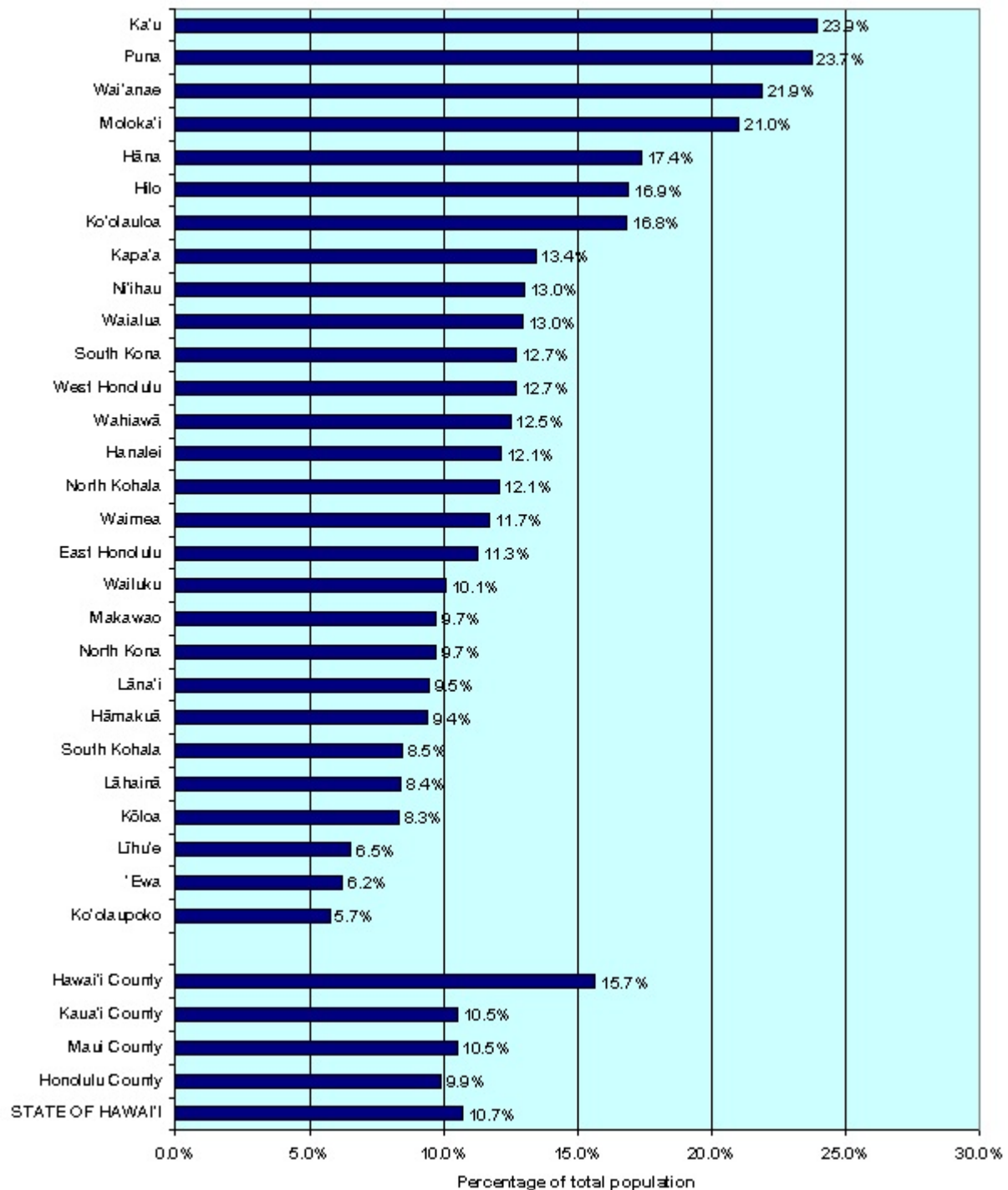
**Source:** Claritas.

**Chart 12: PERCENTAGE OF POPULATION BELOW 200% OF FEDERAL POVERTY LEVEL, 1999**



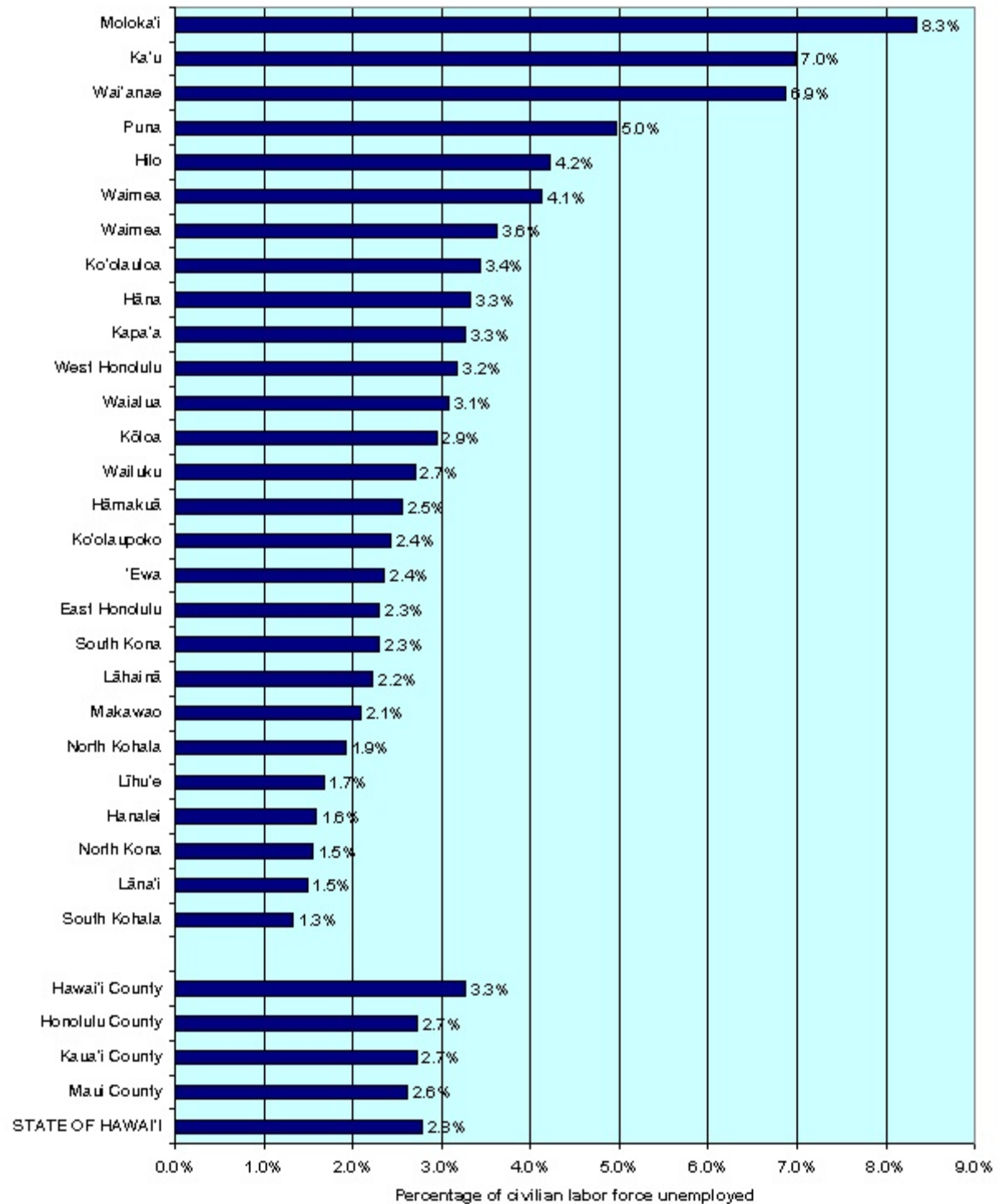
**Source:** U.S. Census Bureau, Census 2000.

**Chart 13: PERCENTAGE OF POPULATION BELOW 100% OF FEDERAL POVERTY LEVEL, 1999**



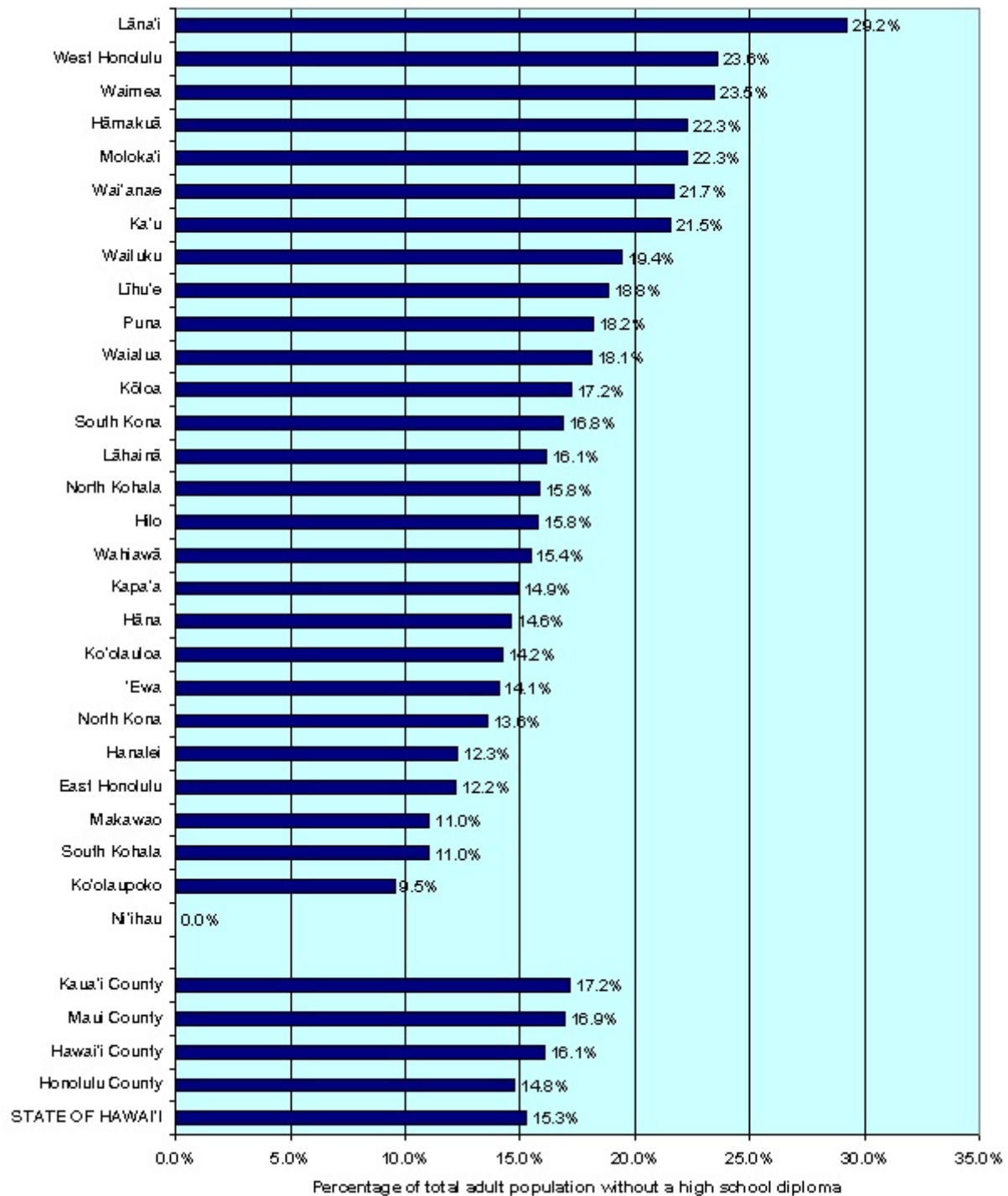
**Source:** U.S. Census Bureau, Census 2000.

**Chart 14: UNEMPLOYMENT RATE, 2005**



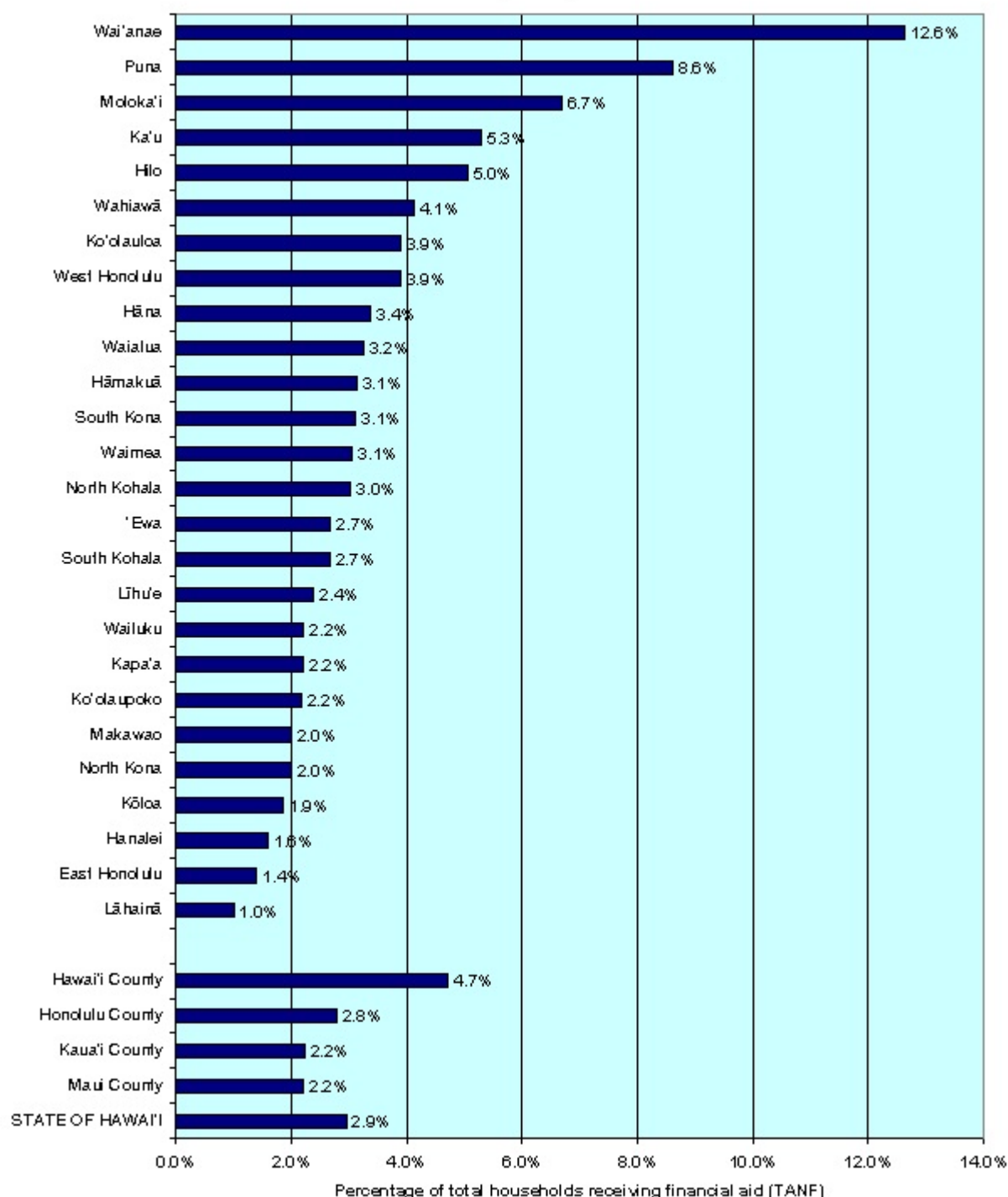
**Source:** State of Hawai'i, Department of Labor and Industrial Relations, Research and Statistics Office.

**Chart 15: PERCENTAGE OF POPULATION 18 YEARS AND OVER WITH NO HIGH SCHOOL DIPLOMA, 2000**



**Source:** U.S. Census Bureau, Census 2000.

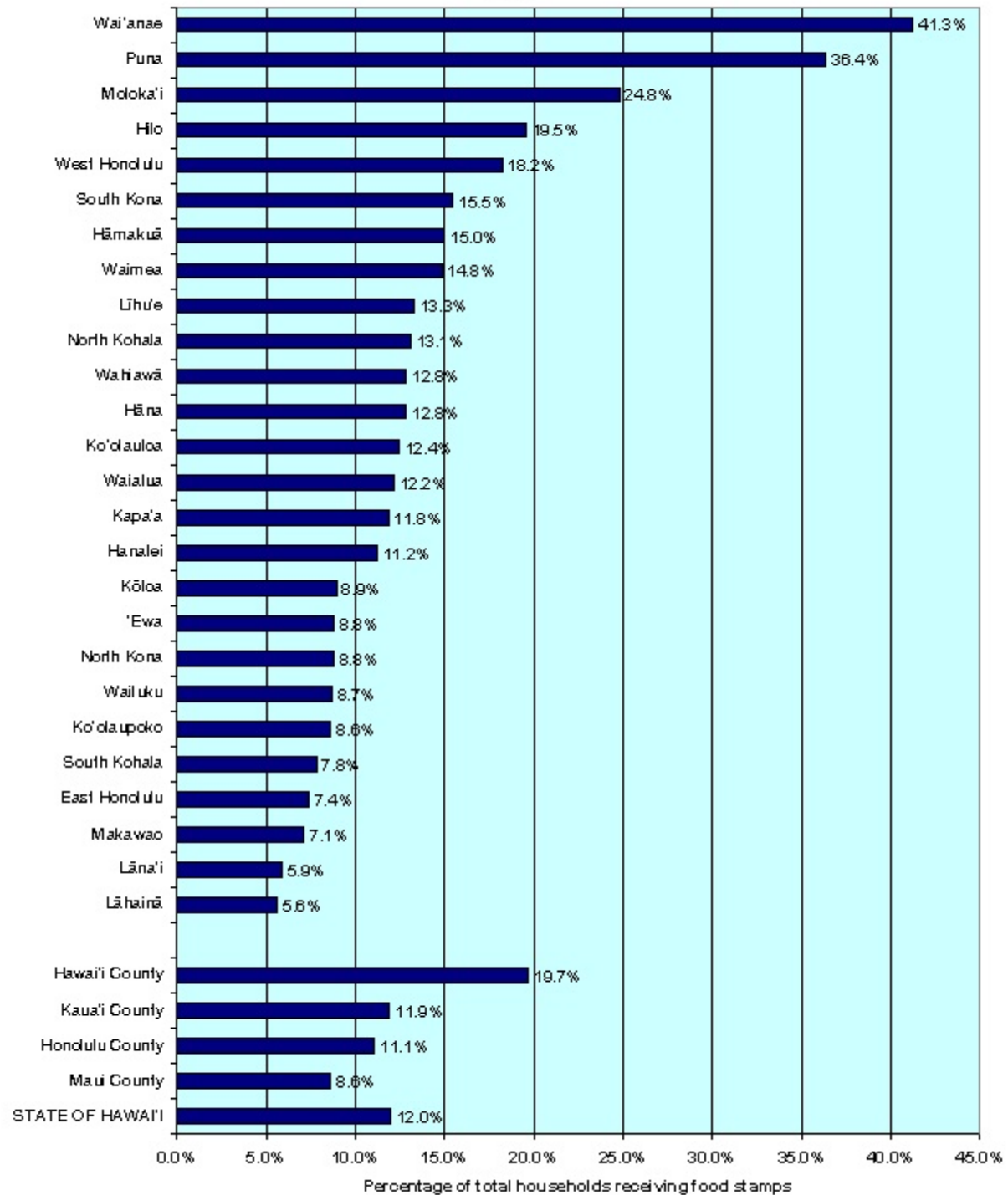
**Chart 16: PERCENTAGE OF HOUSEHOLDS RECEIVING FINANCIAL AID (TANF), 2004**



**Source:** State of Hawai'i, Department of Human Services, Benefit Employment and Support Services Division, Statistics Office.



**Chart 17: PERCENTAGE OF HOUSEHOLDS RECEIVING FOOD STAMPS, 2004**



**Source:** State of Hawai'i, Department of Human Services, Benefit Employment and Support Services Division, Statistics Office.



# CHAPTER 3 INDICATORS OF RISK AND RESOURCES

## Risk Indicators

A quantitative measure of the health and socio-economic risk faced by the population is used as a proxy for measuring the level of need for primary care services. It is implicitly assumed that the higher the measured risk is in a particular service area, the greater is the perceived need for primary care services. While the risk assessment approach may not be sufficient to capture all the complex dimensions of need, it allows for ease and objectivity in the comparative analysis of service areas. Other favorable features are the reasonableness of the data requirements and the flexibility it allows in the selection of risk indicators.

The Klerman-Rosenbach model<sup>2</sup> is used as the basis for the risk assessment. Two sets of risk indicators are used: (a) maternal and child health risk and (b) socio-economic risk.

The variables for maternal and child health risk are:

1. infant mortality rate,
2. inadequate prenatal care rate,
3. low-birthweight birth rate, and
4. teen birth rate.

The socio-economic variables used are:

1. percentage of population below 200% of poverty level,
2. percentage of population age 65 years and over,
3. unemployment rate,
4. low parental education rate,
5. percentage of households receiving public assistance, and
6. percentage of households receiving food stamps.

The data are presented in Table 5 and Table 7.

## Methodology for Risk Scoring

For each service area, a standardized score is computed for maternal and child health risk, socio-economic risk, and combined health and socio-economic risk. The standardized score is computed as follows:

---

<sup>2</sup> Klerman, Lorraine V. and Margo Rosenbach. Need Indicators in Maternal and Child Health Planning. A manual developed at the Florence Heller Graduate School for Advanced Studies in Social Welfare, Brandeis University, Fall 1984.

$SS_{ij} = (X_{ij} - X_{\text{mean}}) / SD_j$ , where

$SS_{ij}$  = standardized score for the  $i^{\text{th}}$  service area on the  $j^{\text{th}}$  variable

$X_{ij}$  = raw score for the  $i^{\text{th}}$  service area on the  $j^{\text{th}}$  variable

$X_{\text{mean}}$  = mean for the  $j^{\text{th}}$  variable

$SD_j$  = standard deviation for the  $j^{\text{th}}$  variable

A composite risk score (RS) is then computed for each service area by adding the standardized scores for all variables, i.e.,

$RS_i = SS_{i1} + SS_{i2} + \dots + SS_{in}$ , where

$RS_i$  = composite score for service area  $i$

$SS_{i1} + \dots + SS_{in}$  = the standardized scores for service area  $i$  on variable 1 to variable  $n$ .

This method assumes that the standardized scores are additive. For this reason, the results must be interpreted with care.

A high positive risk score implies that the population in the service area is at a relatively high risk for poor health. A low negative risk score implies a relatively low risk for poor health. It must be emphasized that the absolute numbers, by themselves, are less meaningful than what is revealed when interpreted in relative terms. Moreover, the scoring is based on a few selected indicators and changes to these variables may affect the risk scores and the ranking of service areas.

The results of the area ranking are presented in Table 6, Table 8, and Table 9. The service areas are ranked on the basis of their composite risk scores for maternal and child health risk, for socio-economic risk, and for combined health and socio-economic risk. Remember that this ranking process is only a relative measure and that an area's rank may change not only due to its own score but the increase or decrease in the score of another service area.

**Table 5: MATERNAL AND INFANT HEALTH RISK INDICATORS, 1999-2004**

Service Area	Infant Mortality Rate (IMR)	Percent Less than Adequate Prenatal Care Utilization	Percent Low Birth Weight (LBW) Births	Percent of Births to Teen Mothers
<b>State</b>	6.9	25.2%	8.0%	2.0%
<b>Honolulu</b>	6.9	21.1%	8.1%	1.7%
East Honolulu	5.4	21.5%	8.0%	1.0%
West Honolulu	7.6	19.0%	8.6%	1.7%
'Ewa	6.8	18.7%	8.6%	1.6%
Wahiawā	7.7	23.6%	7.2%	1.4%
Wai'anāe	12.9	26.8%	8.2%	4.3%
Waialua	8.1	22.2%	8.2%	1.6%
Ko'olaupoko	6.4	31.4%	5.2%	1.6%
<b>Hawai'i</b>	6.5	27.3%	8.2%	3.3%
Hilo	5.6	19.2%	8.1%	3.4%
Puna	6.4	20.7%	9.2%	4.1%
Ka'u	16.1	45.3%	8.0%	4.8%
South Kona	7.4	48.1%	7.4%	3.6%
North Kona	5.9	41.0%	6.1%	2.8%
South Kohala	4.9	23.1%	9.2%	1.6%
North Kohala	11.8	25.2%	8.2%	3.5%
Hāmākua	7.0	22.2%	11.5%	3.7%
<b>Maui</b>	5.8	50.2%	6.8%	2.2%
Hāna	10.6	65.4%	8.5%	3.7%
Makawao	5.0	43.2%	6.5%	1.7%
Wailuku	6.3	48.3%	6.7%	2.3%
Lāhainā	3.6	71.3%	6.5%	1.3%
Lāna'i	4.4	81.0%	8.9%	3.5%
Moloka'i	9.8	25.4%	8.8%	4.6%
<b>Kaua'i</b>	4.7	26.7%	7.3%	2.9%
Hanalei	2.1	27.3%	4.5%	1.3%
Kapa'a	6.1	26.0%	5.5%	3.0%
Līhu'e	4.5	26.4%	8.9%	3.0%
Kōloa	4.2	25.6%	7.6%	2.9%
Waimea	4.7	28.9%	10.4%	3.9%
Nī'ihau	0.0	0.0	0.0	0.0

**Table 6: RANKING BASED ON MATERNAL AND INFANT HEALTH RISK SCORES**

Service Area County-wide	Current Risk Rank	Current Risk Score	Service Area State-wide	Current Risk Rank	Current Risk Score
<b>Honolulu</b>	<i>(highest)</i>		<b>State of Hawai'i</b>	<i>(highest)</i>	
Wai'anae	1	3.2	Ka'u	1	5.6
West Honolulu	2	-1.0	Hāna	2	4.4
Waialua	3	-1.1	Lāna'i	3	3.4
'Ewa	4	-1.3	Wai'anae	4	3.2
Wahiawā	5	-1.9	Moloka'i	5	2.6
Ko'olaupoko	6	-2.6	Hāmākua	6	2.6
East Honolulu	7	-2.6	North Kohala	7	2.0
Ko'olaupoko	8	-3.0	Waimea	8	1.7
	<i>(lowest)</i>		South Kona	9	1.4
<b>Hawai'i</b>	<i>(highest)</i>		Puna	10	1.2
Ka'u	1	5.6	Līhu'e	11	-0.3
Hāmākua	2	2.6	Wailuku	12	-0.4
North Kohala	3	2.0	Hilo	13	-0.6
South Kona	4	1.4	North Kona	14	-0.9
Puna	5	1.2	Lāhainā	15	-0.9
Hilo	6	-0.6	West Honolulu	16	-1.0
North Kona	7	-0.9	Waialua	17	-1.1
South Kohala	8	-1.3	'Ewa	18	-1.3
	<i>(lowest)</i>		South Kohala	19	-1.3
<b>Maui</b>	<i>(highest)</i>		Kōloa	20	-1.3
Hāna	1	4.4	Makawao	21	-1.8
Lāna'i	2	3.4	Wahiawā	22	-1.9
Moloka'i	3	2.6	Kapa'a	23	-2.0
Wailuku	4	-0.4	Ko'olaupoko	24	-2.6
Lāhainā	5	-0.9	East Honolulu	25	-2.6
Makawao	6	-1.8	Ko'olaupoko	26	-3.0
	<i>(lowest)</i>		Hanalei	27	-5.3
<b>Kaua'i</b>	<i>(highest)</i>			<i>(lowest)</i>	
Waimea	1	1.7			
Līhu'e	2	-0.3			
Kōloa	3	-1.3			
Kapa'a	4	-2.0			
Hanalei	5	-5.3			
	<i>(lowest)</i>				

**Table 7: SOCIO-ECONOMIC RISK INDICATORS**

Service Area	Population <200% of Poverty (1999)	Population Age 65 and Over (2000)	Civilian Unemployment Rate (2005)	Adults without High School Diploma (2000)	Financial Aid (TANF) (2004)	Food Stamps (2004)
<b>State</b>	25.9%	13.3%	2.8%	15.3%	2.9%	12.0%
<b>Honolulu</b>	24.4%	13.4%	2.7%	14.8%	2.8%	11.1%
East Honolulu	23.0%	19.1%	2.3%	12.2%	1.4%	7.4%
West Honolulu	32.7%	15.5%	3.2%	23.6%	3.9%	18.2%
'Ewa	18.2%	10.0%	2.4%	14.1%	2.7%	8.8%
Wahiawā	38.7%	9.4%	4.1%	15.4%	4.1%	12.8%
Wai'anae	44.1%	8.1%	6.9%	21.7%	12.6%	41.3%
Waialua	33.9%	11.1%	3.1%	18.1%	3.2%	12.2%
Ko'olauloa	35.8%	8.0%	3.4%	14.2%	3.9%	12.4%
Ko'olaupoko	18.1%	11.9%	2.4%	9.5%	2.2%	8.6%
<b>Hawai'i</b>	34.5%	13.5%	3.3%	16.1%	4.7%	19.7%
Hilo	34.3%	17.3%	4.2%	15.8%	5.0%	19.5%
Puna	48.0%	10.2%	5.0%	18.2%	8.6%	36.4%
Ka'u	47.4%	15.1%	7.0%	21.5%	5.3%	0.5%
South Kona	31.7%	13.2%	2.3%	16.8%	3.1%	15.5%
North Kona	24.4%	11.8%	1.5%	13.6%	2.0%	8.8%
South Kohala	25.8%	9.0%	1.3%	11.0%	2.7%	7.8%
North Kohala	26.3%	13.4%	1.9%	15.8%	3.0%	13.1%
Hāmākua	31.6%	17.2%	2.5%	22.3%	3.1%	15.0%
<b>Maui</b>	25.0%	11.4%	2.6%	16.9%	27.3%	8.6%
Hāna	40.7%	10.4%	3.3%	14.6%	3.4%	12.8%
Makawao	23.1%	9.9%	2.1%	11.0%	2.0%	7.1%
Wailuku	24.6%	12.3%	2.7%	19.4%	2.2%	8.7%
Lāhainā	21.2%	10.2%	2.2%	16.1%	1.0%	5.6%
Lāna'i	24.7%	14.6%	1.5%	29.2%	1.1%	5.9%
Moloka'i	42.3%	13.5%	8.3%	22.3%	6.7%	24.8%
<b>Kaua'i</b>	27.5%	13.8%	2.7%	17.2%	2.2%	11.9%
Hanalei	31.0%	10.4%	1.6%	12.3%	1.6%	11.2%
Kapa'a	31.5%	10.7%	3.3%	14.9%	2.2%	11.8%
Līhu'e	22.2%	17.1%	1.7%	18.8%	2.4%	13.3%
Kōloa	20.9%	15.5%	2.9%	17.2%	1.9%	8.9%
Waimea	32.1%	16.0%	3.6%	23.5%	3.1%	14.8%

**Table 8: RANKING BASED ON SOCIO-ECONOMIC RISK SCORES**

Service Area County-wide	Current Risk Rank	Current Risk Score	Service Area State-wide	Current Risk Rank	Current Risk Score
<b>Honolulu</b>	<i>(highest)</i>		<b>State of Hawai'i</b>	<i>(highest)</i>	
Wai'anae	1	11.04	Wai'anae	1	11.04
West Honolulu	2	3.76	Puna	2	8.70
Waialua	3	-0.32	Moloka'i	3	6.55
Wahiawā	4	-0.36	West Honolulu	4	3.76
Ko'olaupoko	5	-1.60	Hilo	5	3.63
East Honolulu	6	-2.09	Hāmākua	6	2.88
'Ewa	7	-4.32	Waimea	7	2.72
Ko'olaupoko	8	-4.95	Ka'u	8	1.44
	<i>(lowest)</i>		South Kona	9	0.55
<b>Hawai'i</b>	<i>(highest)</i>		Līhu'e	10	0.34
Puna	1	8.70	Lāna'i	11	-0.13
Hilo	2	3.63	Hāna	12	-0.30
Hāmākua	3	2.88	Waialua	13	-0.32
Ka'u	4	1.44	Wahiawā	14	-0.76
South Kona	5	0.55	North Kohala	15	-0.82
North Kohala	6	-0.82	Ko'olaupoko	16	-1.60
North Kona	7	-3.43	Kōloa	17	-1.87
South Kohala	8	-4.65	Kapa'a	18	-1.90
	<i>(lowest)</i>		Wailuku	19	-1.91
<b>Maui</b>	<i>(highest)</i>		East Honolulu	20	-2.09
Moloka'i	1	6.55	Hanalei	21	-2.99
Lāna'i	2	-0.13	North Kona	22	-3.43
Hāna	3	-0.30	'Ewa	23	-4.32
Wailuku	4	-1.91	South Kohala	24	-4.65
Lāhainā	5	-4.89	Lāhainā	25	-4.89
Makawao	6	-5.11	Ko'olaupoko	26	-4.95
	<i>(lowest)</i>		Makawao	27	-5.11
<b>Kaua'i</b>	<i>(highest)</i>			<i>(lowest)</i>	
Waimea	1	2.72			
Līhu'e	2	0.34			
Kōloa	3	-1.87			
Kapa'a	4	-1.90			
Hanalei	5	-2.99			
	<i>(lowest)</i>				



**Table 9: RANKING BASED ON THE MATERNAL AND INFANT HEALTH, AND SOCIO-ECONOMIC HEALTH RISK SCORES**

Service Area County-wide	Current Risk Rank	Current Risk Score	Service Area State-wide	Current Risk Rank	Current Risk Score
<b>Honolulu</b>	<i>(highest)</i>		<b>State of Hawai'i</b>	<i>(highest)</i>	
Wai'anae	1	14.2	Wai'anae	1	14.2
West Honolulu	2	2.8	Puna	2	9.9
Waialua	3	-1.4	Moloka'i	3	9.2
Wahiawā	4	-2.2	Ka'u	4	7.1
Ko'olaupoko	5	-4.6	Hāmākua	5	5.4
East Honolulu	6	-4.7	Waimea	6	4.4
'Ewa	7	-5.6	Hāna	7	4.1
Ko'olaupoko	8	-7.5	Lāna'i	8	3.2
	<i>(lowest)</i>		Hilo	9	3.1
<b>Hawai'i</b>	<i>(highest)</i>		West Honolulu	10	2.8
Puna	1	9.9	South Kona	11	2.0
Ka'u	2	7.1	North Kohala	12	1.2
Hāmākua	3	5.4	Līhu'e	13	0.0
Hilo	4	3.1	Waialua	14	-1.4
South Kona	5	2.0	Wailuku	15	-2.3
North Kohala	6	1.2	Wahiawā	16	-2.6
North Kona	7	-4.3	Kōloa	17	-3.2
South Kohala	8	-6.0	Kapa'a	18	-3.9
	<i>(lowest)</i>		North Kona	19	-4.3
<b>Maui</b>	<i>(highest)</i>		Ko'olaupoko	20	-4.6
Moloka'i	1	9.2	East Honolulu	21	-4.7
Hāna	2	4.1	'Ewa	22	-5.6
Lāna'i	3	3.2	Lāhainā	23	-5.8
Wailuku	4	-2.3	South Kohala	24	-6.0
Lāhainā	5	-5.8	Makawao	25	-6.9
Makawao	6	-6.9	Ko'olaupoko	26	-7.5
	<i>(lowest)</i>		Hanalei	27	-8.3
<b>Kaua'i</b>	<i>(highest)</i>			<i>(lowest)</i>	
Waimea	1	4.4			
Līhu'e	2	0.0			
Kōloa	3	-3.2			
Kapa'a	4	-3.9			
Hanalei	5	-8.3			
	<i>(lowest)</i>				

Maternal and child health and services are affected by social and economic factors. Combining the two risk scores may indicate a community at greater risk for poor health outcomes.



# CHAPTER 4 FEDERAL DESIGNATIONS

## Background on Federal Designations<sup>3</sup>

### Health Professional Shortage Area (HPSA)

A Health Professional Shortage Area (HPSA) means any of the following which has a shortage of health professionals: (a) an urban or rural area which is a rational service area for the delivery of health services, (b) a population group, or (c) a public or nonprofit private medical facility. HPSAs are divided into three major categories according to the type of health professional shortage: primary care, dental and mental health HPSAs. In more specific cases, areas may also be designated as having shortages of professionals in vision care, pharmacy, podiatry and veterinary medicine. The programs that require HPSA designation are the National Health Service Corps (NHSC) Recruitment, the NHSC/State Loan Repayment Program, and the Rural Health Clinic Certification Program. The Area Health Education Center (AHEC) Program gives special consideration to centers that serve HPSAs with higher percentages of underserved minorities, and gives special funding priority to centers providing substantial training experience in HPSAs. The Division of Shortage Designation of the Bureau of Health Professions is responsible for determining designations of HPSAs.

### Medically Underserved Area/Population (MUA/MUP)

According to Sections 1302(7) and 330(b) of the Public Health Service (PHS) Act, the term *medically underserved area or medically underserved population* means the population of an urban or rural area designated as an area with a shortage of personnel health services. Recipients of Community Health Center (CHC) grant funds are legislatively required to serve areas or populations designated as medically underserved. Grants for the planning, development, or operation of community health centers under Section 330 of the PHS Act are available only to centers that serve designated MUAs or MUPs. Systems of care which meet the definition of a community health center but are not funded under Section 330, and are serving a designated MUA or MUP are eligible for certification as Federally Qualified Health Centers (FQHCs). The Division of Shortage Designation of the Bureau of Health Professions determines MUA/MUP designations.

### Rural Health Center (RHC)

Section 1861(aa)(2) of the Social Security Act states that a rural health clinic must be located in an area that is *not urbanized* and that has been designated as a shortage area. Rural Health Centers must employ mid-level practitioners such as nurse practitioners, nurse midwives, and

---

3 Sources: Public Health Service, HHS, 42 CFR Part 5 as of January 18, 1996; Bureau of Primary Health Care, Guidelines for MUA/MUP Designation, June 12, 1995; Richard C. Lee, Current Approaches to Shortage Area Designation, The Journal of Rural Health, Vol. 7 (4) Supp. 1991; Beth Giesting, Outline of Federal Designations for Areas, Populations, and Providers, (part of memo to Representative Kahikina, dated January 23, 1996, Honolulu); National Association of County Health Officials, National Health Service Corps: Applying for Corps Personnel, January 17, 1992.

physician assistants. It must provide the same services that are required of a community health center. In addition, if a Rural Health Center serves a HPSA or MUA/MUP, it is eligible to receive enhanced Medicaid (except under a waived program like QUEST) and Medicare payments for services.

### **Federally Qualified Health Center**

A Federally Qualified Health Center is an entity which meets the requirements of a federally-funded health center, whether or not it receives a grant under Sections 329, 330 or 340 of the Public Health Service Act. These requirements include being nonprofit, having a community-based board of directors, providing or arranging all the necessary and enabling services, and providing care regardless of the ability to pay.

### **National Health Service Corps (NHSC)**

The National Health Service Corps is a program for the recruitment of primary care providers in HPSAs. NHSC is operated through the Bureau of Health Care and Delivery Assistance, Health Resources and Services Administration. NHSC providers consist of three types:

- a) *Obligated Scholars - medical school or mid-level practitioner graduates who have been provided tuition in support of return for obligated service in HPSAs;*
- b) *Loan Repayment Program Participants - NHSC provides the state with matching grants to repay educational loans in exchange for service in HPSAs;*
- c) *Commissioned Officers - the National Health Service Corps allocates dentists and physicians who are assigned by the corps to work in a underserved area: and*
- d) *Volunteers - Health Professional who are interested in serving in an underserved area.*

**Table 10: ELIGIBILITY CRITERIA AND DATA REQUIREMENTS FOR A SHORTAGE DESIGNATION**

**Medically Underserved Area (MUA)**

Involves application of the Index of Medical Underservice (IMU) to obtain score on a scale of 0 to 100. An IMU of 62.0 or less qualifies area for designation as MUA.

- Rational service area,
- Percentage of population below 100% of poverty,
- Percentage of population age 65 years and over,
- Infant mortality rate, and
- Ratio of primary care physicians per 1000 population.

If total score is over 62.0, an area may still be designated upon documentation of unusual local conditions which are a barrier to access to or the availability of personal health services.

**Medically Underserved Population (MUP)**

Involves application of the IMU to data on an underserved population group within a geographic area.

- Population with economic barriers (low-income or Medicaid eligible population), or
- Populations with cultural and/or linguistic access barriers to primary care.

Involves assembling data as stated for MUAs except that:

- The population now refers to the population of the requested group within the area and not the total resident population of the area, and
- The number of FTE primary care physicians includes only those serving the requested population group.

If total weighted value is 62.0 or less, the population group qualifies for designation as MUP.

**Primary Care Health Profession Shortage Area (HPSA)**

**Geographic HPSA**

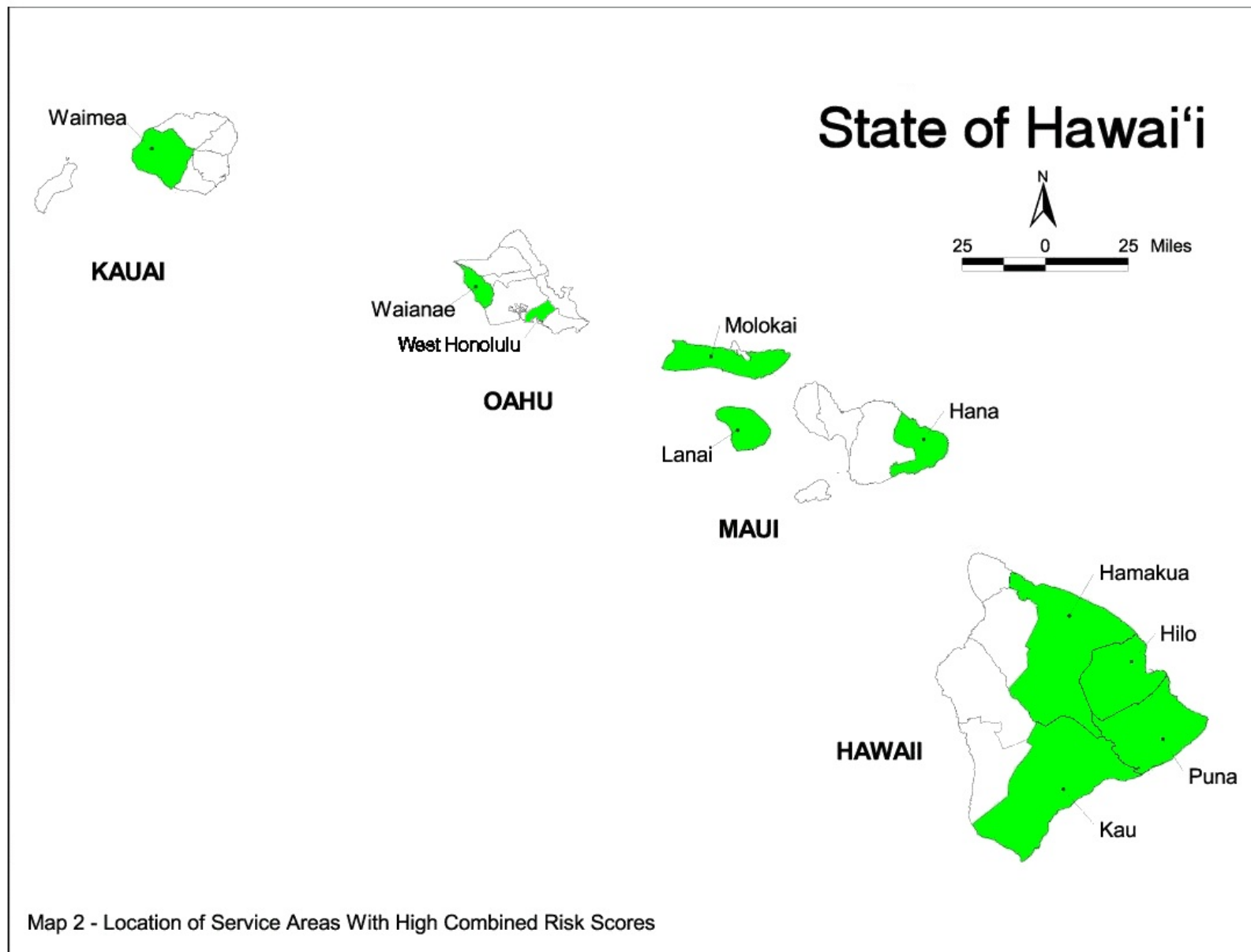
- Rational service area,
- Population to FTE primary care physician ratio at least 3,500:1 (high needs area) or 3,000:1 (unusually high needs area). An area is defined, as an unusually high needs area, if any of the following conditions exist:
  - a) >100 births per year per 1000 women age 15 to 44 years,
  - b) >20 infant deaths per 1000 live births, or
  - c) >20% of households with incomes below poverty.
- primary care professionals in contiguous areas are overutilized, excessively distant, or inaccessible, if any of the following occur:
  - a) >30 minutes from area center,
  - b) FTE > 2,000:1 , or
  - c) Inaccessible due to demographic or socio-economic barriers.

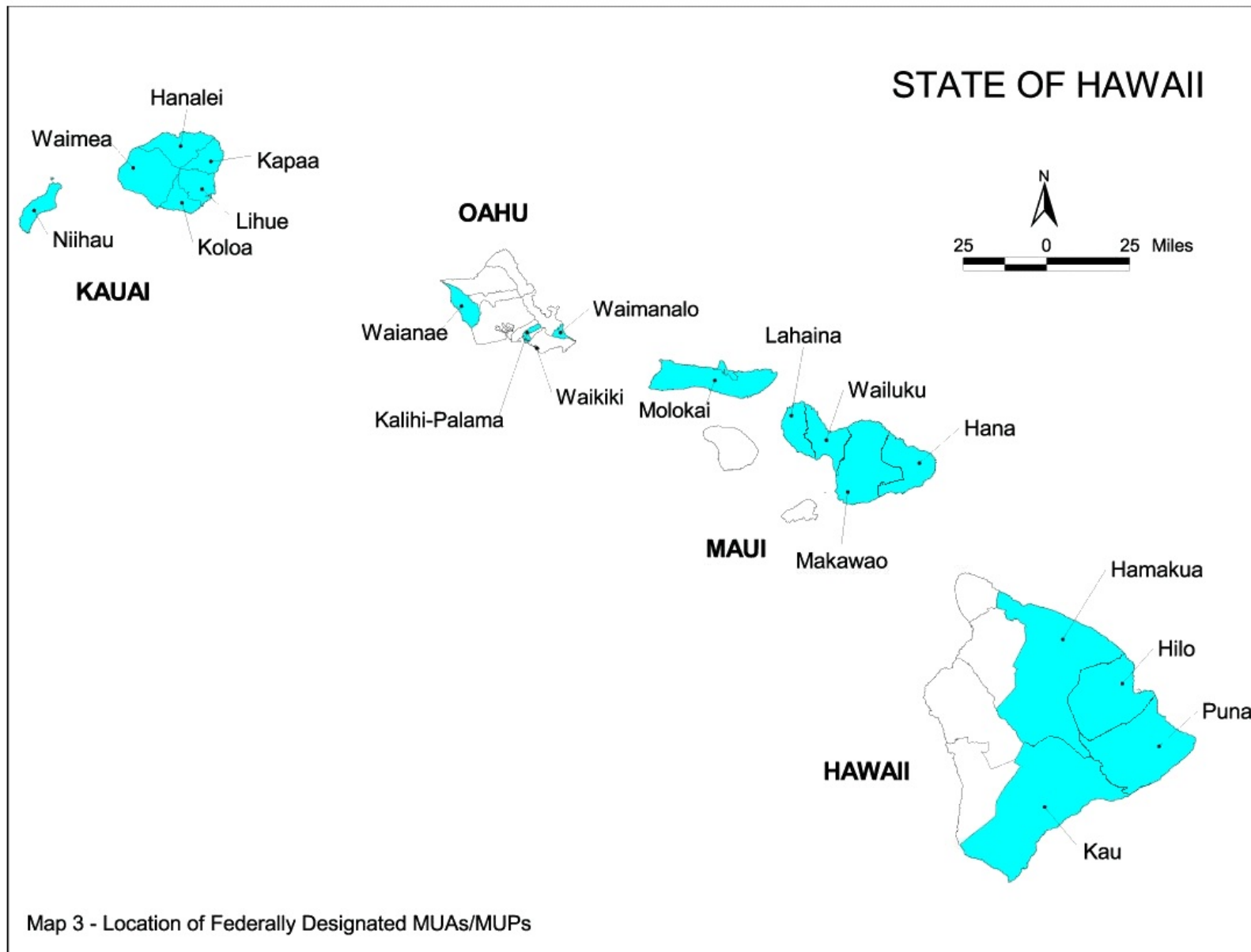
Population group HPSA: if a geographic area does not meet the shortage criteria but a population group within the area has access barriers.

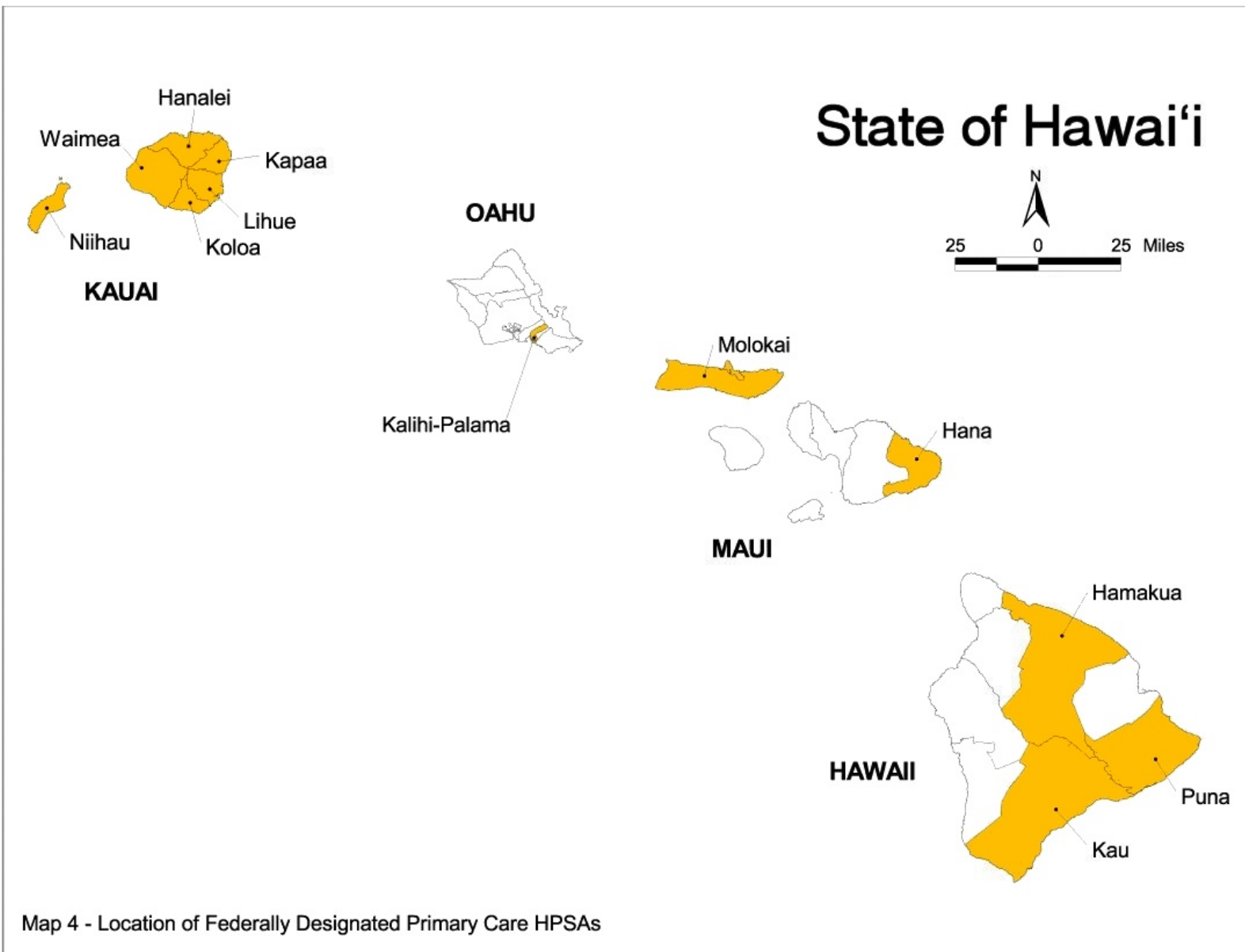
- Low-income: minimum 30% of population at or < 200% of poverty,
- Medicaid-eligible population: minimum 30% of population at or < 200% of poverty,
- Migrant farmworkers and families,
- American Indians or Native Alaskans,
- Homeless, or
- Other population isolated by linguistic or cultural barriers or by handicaps.

Sources: Bureau of Primary Health Care, Guidelines for MUA/MUP Designation and Guidelines for HPSA Designation, June 12, 1995.

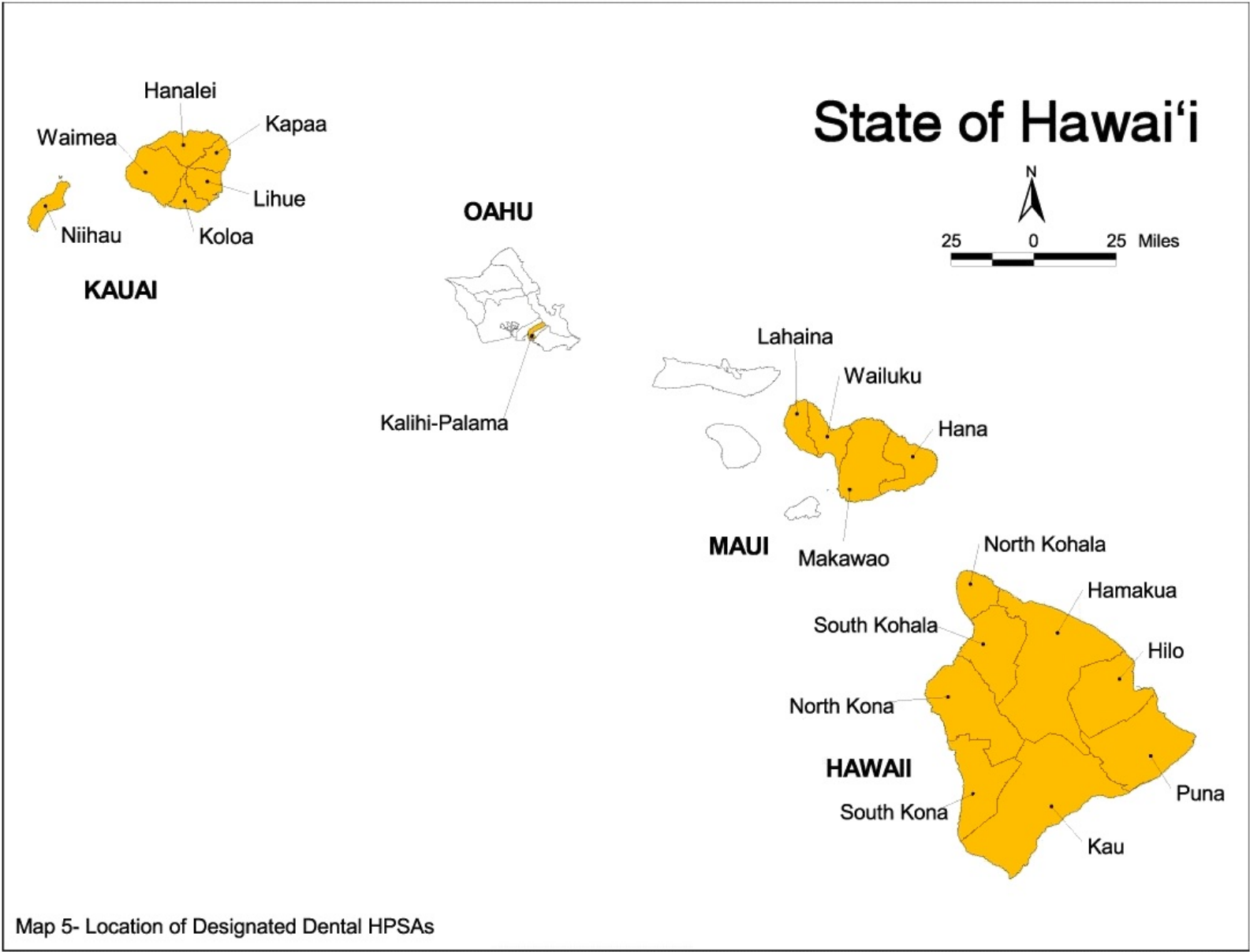
Public Health Service, HHS, 42 CFR, Ch1, Part 5, As of January 18, 1996



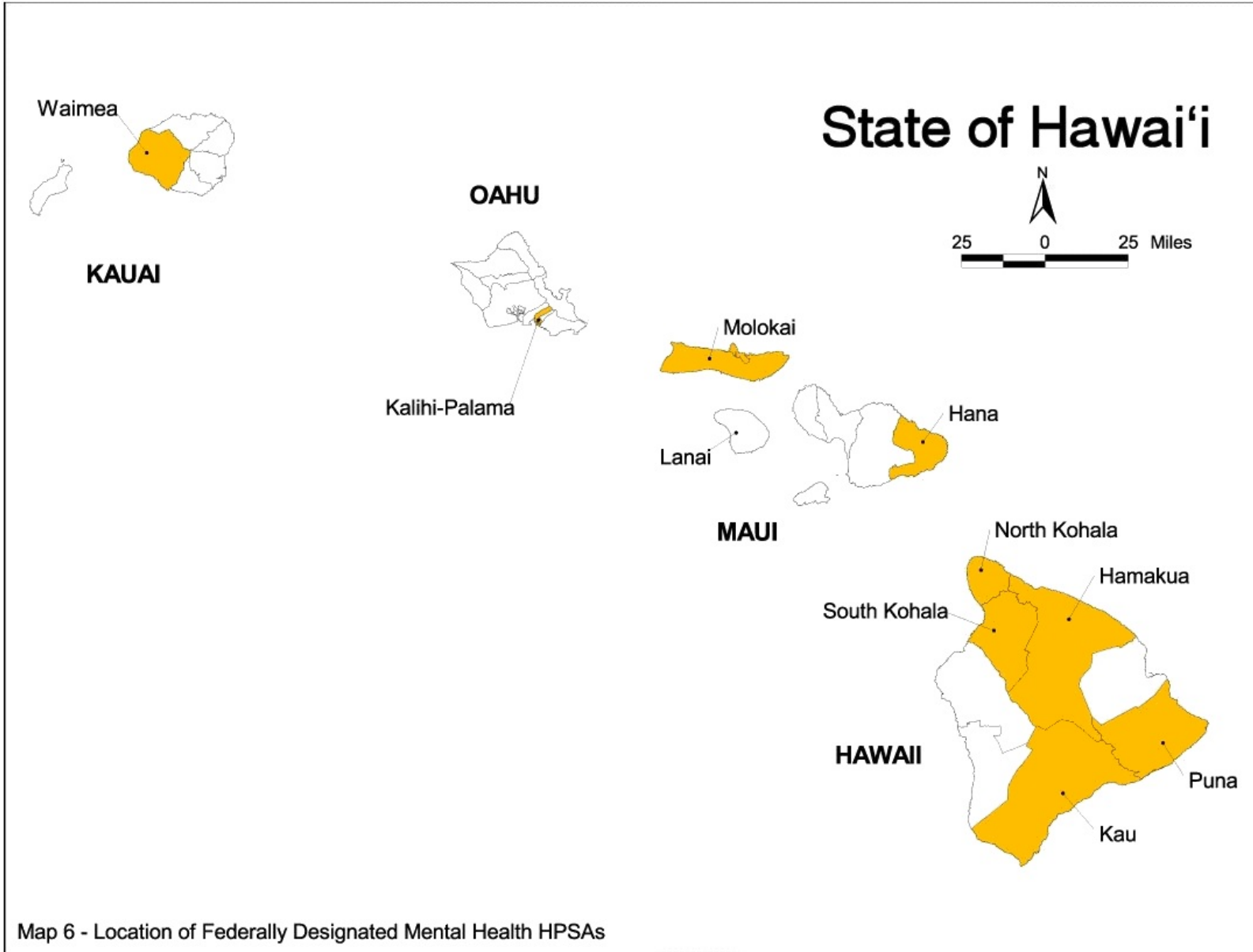


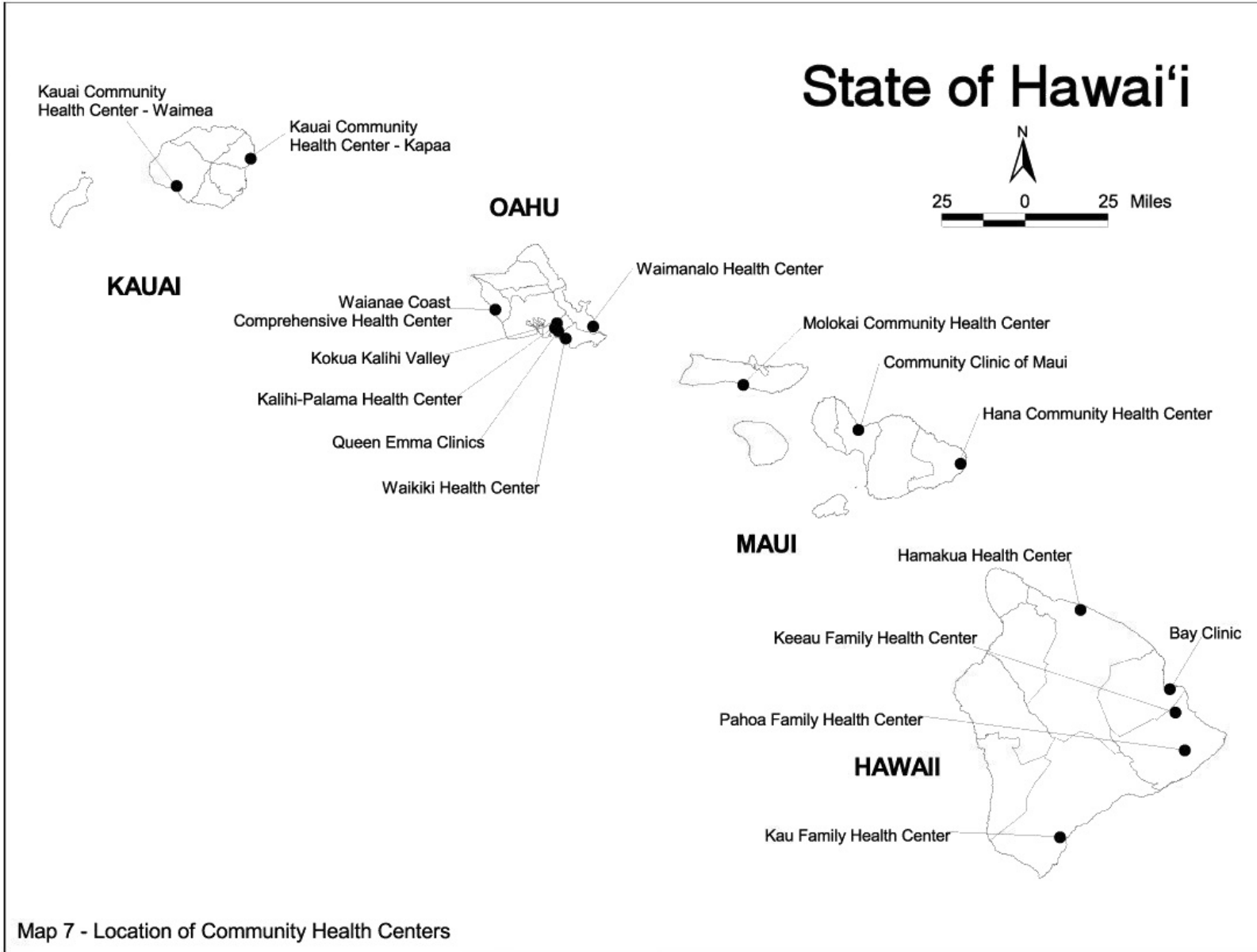






Map 5- Location of Designated Dental HPSAs





**Table 11: STATUS OF FEDERAL DESIGNATIONS AND ASSISTANCE** (as of December 2005)

Area	Medically Underserved Area/Population (MUA/P)	Primary Care HPSA	Dental HPSA	Mental Health HPSA	Date of HPSA Designation		
					PC	Dental	Mental Health
(Census Tract)	Designations						
Maui County							
Hana/Ha'ikū (301-302)	MUP	✓	✓	✓✓ (301)	4/01	6/00	9/01
Maui (303-315)	MUP		✓✓			6/02	
Lāna'i Island (316)	MUP	✓✓			9/03		
Moloka'i Island (317-319)	MUA	✓	✓✓ (317-318)	✓	3/01	4/03	8/00
Hawai'i County							
Hilo (201-209)	MUP		✓✓			3/01	
Puna (210-211)	MUP	✓ (211)	✓✓	✓	3/01	3/01	3/02
Ka'u (212)	MUP	✓	✓✓	✓	3/01	3/01	12/01
Hāmākua (219-221)	MUP	✓	✓✓	✓✓	12/01	3/01	1/02
Kona (213-216)	MUP		✓✓			3/01	
Kohala (217-218)	MUP		✓✓	✓✓		3/01	1/02
City & County of Honolulu							
Kalihi-Pālama (51-56)	MUP	✓✓	✓✓	✓	4/01	11/05	4/01
Kalihi Valley (61-66)	MUA	✓✓	✓✓	✓	4/01	11/05	4/01
Ko'olau Loa (101-102)	MUA						
Waikīkī (18-20.02)	MUP						
Waimānalo (113)	MUP						
Wai'anae (96-98)	MUA						
Kaua'i County							
Kaua'i County	MUP	✓✓	✓✓	✓ (408–409)	12/02	2/02	3/02

MUA or MUP – Medically Underserved Area or Population      FQHC – Federally Qualified Health Center (330 or 340 grantee)  
 HPSA – Health Professional Shortage Area      RHC – Rural Health Center      NHSC – National Health Service Corps  
 330 – Community Health Center Program      340 – Homeless Health  
 ✓ - Approved as an Area designation      ✓✓ - Approved as a Population designation

**Table 12: RISK SCORES & CLASSIFICATIONS OF FEDERAL DESIGNATIONS** (as of December 2005)

Facility	Primary Care <sup>1</sup> Designation Risk Score	Mental Health <sup>1</sup> Designation Risk Score	Dental Health <sup>1</sup> Designation Risk Score	FQHC/RHC Classification 330/340/Facility
<b>Maui County</b>				
Hāna Community Health Center	15	11	15	330
Community Clinic of Maui	2	2	16	330
Moloka'i 'Ohana Health Care	9	19	12	330
Island of Lāna'I	13			
<b>Hawai'i County</b>				
Bay Clinic – Hilo	10	10	14	330
Bay Clinic – Pāhoā	14	19	14	330
Bay Clinic Kea'au			14	330
Ka'u Hospital	14	11	14	RHC
Hāmākua Health Center	9	14	14	330
<b>City &amp; County of Honolulu</b>				
Kalihi Pālama Health Center	10	14	7	330
Kōkua Kalihi Valley	10	14	7	330
Waikīkī Health Center	6	6	6	340
Waimānalo Health Center	6	6	6	330
Wai'anae Coast Comprehensive	7		7	330
<b>Kaua'i County</b>				
Kaua'i Community Health Center	12	8	14	330
<b>Facility Designation</b>				
Hālawā Correctional Facility	15	9	15	Correctional
Federal Detention Center Honolulu	15		15	Correctional
Women's Com. Correctional Center	15	9	15	Correctional

MUA or MUP – Medically Underserved Area or Population      FQHC – Federally Qualified Health Center (330 or 340 grantee)

HPSA – Health Professional Shortage Area

RHC – Rural Health Center

NHSC – National Health Service Corps

330 – Community Health Center Program

340 – Homeless Health

<sup>1</sup> Risk Scores are as of 12/05 and may be subject to change. Check for updated scores at <http://hpsafind.hrsa.gov/HPSASearch.aspx>



## DEVELOPMENTAL HEALTH RISK INDEXES

This edition of the Primary Care Data Book includes two new health risk indexes which are in development for future editions of the data book. The first index centers on chronic disease indicators. Included in this index are measures on diabetes, obesity, smokers, stroke mortality, and chronic heart disease mortality. The second index focuses on oral health indicators. The measures for this index include visits to a dentist, teeth cleaning, and tooth loss.

The data for these two indexes come from the Hawai'i Behavioral Risk Factor Surveillance System (BRFSS) Program, which is part of the Hawai'i State, Department of Health. It is important to be knowledgeable of the BRFSS, in order to correctly interpret information useful in health planning, policy development, evaluation, and research.

The BRFSS is a state-wide survey. The sample design uses a random-digit-dialed probability sample of the adult (aged 18 years and over) population. The sampling is stratified in order to facilitate inter-regional comparisons. The survey consists of a core of questions asked in all States, standardized optional questions on selected topics that are administered at the State's discretion, a rotating core of questions asked every other year in all States, and State-added questions developed to address State-specific needs. The survey is conducted through a telephone interview by a private contractor. The target population is the civilian, noninstitutionalized population 18 years of age and older who reside in households with telephones. The collected data is then weight-adjusted to account for sampling and non-sampling error adjustments.

Consequently, the survey does not reflect the characteristics of the infant, child, and adolescent population of the state. Furthermore, samples for some areas maybe too small to calculate reliable measures, unstable measures are not useful in making decisions.

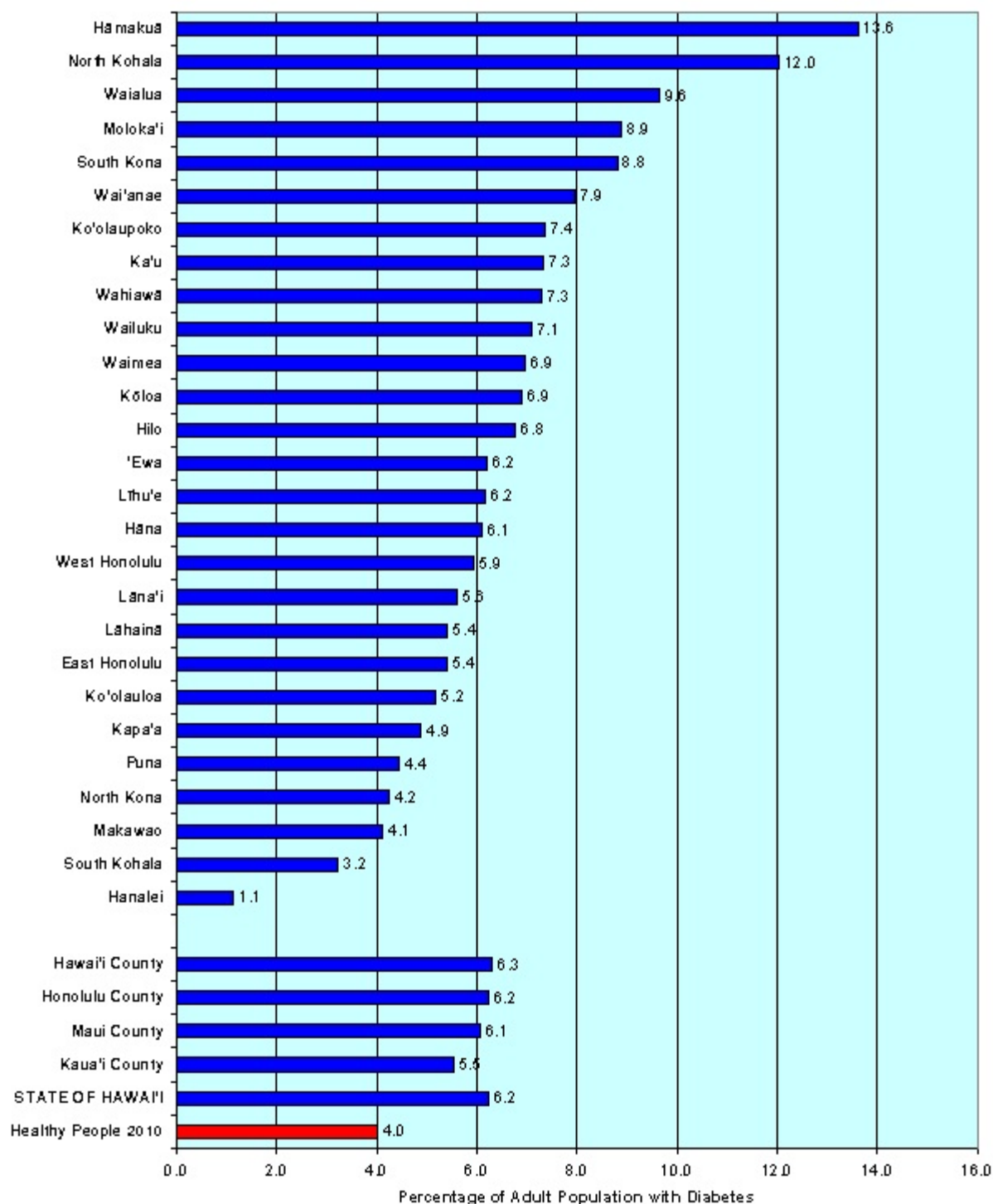
**Table 13: Diabetes Prevalence, 2000-2003**

Service Area	Number of Respondents	Number Who Have Diabetes	Percent with Diabetes	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	3,707,563	230,651	6.2	5.76	6.69
<b>Honolulu</b>	2,610,804	162,477	6.2	5.64	6.80
East Honolulu	781,407	42,144	5.4	4.43	6.36
West Honolulu	377,822	22,394	5.9	4.45	7.41
'Ewa	783,703	48,510	6.2	5.16	7.22
Wahiawā	97,974	7,139	7.3	3.86	10.72
Wai'anae	110,963	8,811	7.9	4.34	11.54
Waialua	41,585	4,008	9.6	4.01	15.27
Ko'olauloa	55,240	2,860	5.2	2.07	8.29
Ko'olaupoko	361,913	26,611	7.4	5.58	9.12
<b>Hawai'i</b>	436,227	27,487	6.3	5.42	7.18
Hilo	151,876	10,286	6.8	5.42	8.13
Puna	55,279	2,453	4.4	2.48	6.39
Ka'u	31,207	2,287	7.3	4.03	10.63
South Kona	29,256	2,574	8.8	5.35	12.25
North Kona	93,269	3,952	4.2	2.76	5.71
South Kohala	39,162	1,262	3.2	1.31	5.14
North Kohala	15,422	1,855	12.0	5.86	18.20
Hāmākua	20,705	2,817	13.6	4.55	22.66
<b>Maui</b>	378,925	22,968	6.1	4.41	7.72
Hāna	6,045	368	6.1	0.00	14.51
Makawao	108,213	4,447	4.1	2.75	5.47
Wailuku	175,361	12,437	7.1	3.76	10.43
Lāhainā	53,863	2,917	5.4	3.04	7.79
Lāna'i	11,059	620	5.6	3.36	7.85
Moloka'i	23,089	2,053	8.9	5.78	12.00
<b>Kaua'i</b>	167,727	9,279	5.5	4.37	6.70
Hanalei	21,405	242	1.1	0.00	2.46
Kapa'a	48,716	2,377	4.9	2.65	7.11
Līhu'e	34,959	2,156	6.2	3.65	8.68
Kōloa	34,952	2,408	6.9	4.11	9.67
Waimea	27,115	1,884	7.0	3.73	10.17
Ni'ihau	581	213	36.7	0.00	90.34

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).



**Chart 18: ADULT DIABETES, 2000-2003**



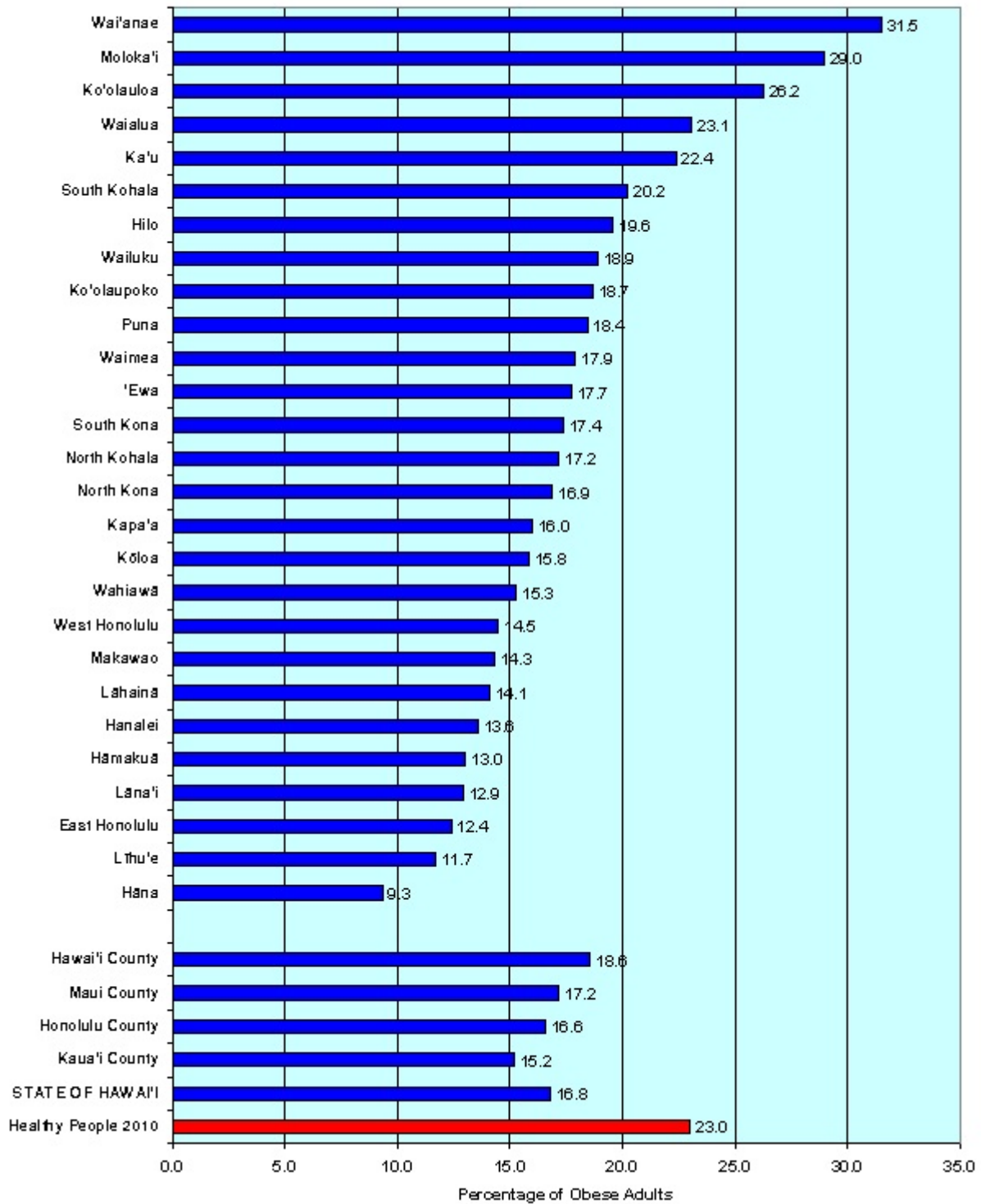
**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Table 14: Adult Obesity, 2000-2003**

Service Area	Number of Respondents	Number Obese (BMI > 35.0)	Percent Obese	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	3,609,680	606,540	16.8	16.07	17.54
<b>Honolulu</b>	2,546,679	421,891	16.6	15.63	17.51
East Honolulu	757,338	93,804	12.4	10.91	13.86
West Honolulu	366,549	53,058	14.5	12.03	16.92
'Ewa	766,083	135,821	17.7	15.94	19.52
Wahiawā	96,466	14,741	15.3	10.72	19.85
Wai'anae	108,720	34,239	31.5	25.74	37.25
Waialua	41,670	9,624	23.1	14.21	31.99
Ko'olaupoko	54,326	14,260	26.3	18.16	34.34
Ko'olaupoko	355,329	66,345	18.7	16.08	21.26
<b>Hawai'i</b>	426,786	79,261	18.6	17.17	19.97
Hilo	147,533	28,883	19.6	17.07	22.09
Puna	54,355	10,023	18.4	14.47	22.41
Ka'u	30,083	6,731	22.4	17.10	27.64
South Kona	28,607	4,971	17.4	12.28	22.47
North Kona	91,745	15,504	16.9	13.98	19.82
South Kohala	39,003	7,896	20.3	15.61	24.88
North Kohala	15,385	2,644	17.2	10.19	24.18
Hāmākua	20,025	2,609	13.0	8.25	17.81
<b>Maui</b>	371,063	63,731	17.2	15.16	19.19
Hāna	6,045	564	9.3	0.00	21.83
Makawao	104,388	14,944	14.3	11.85	16.78
Wailuku	173,469	32,781	18.9	15.26	22.54
Lāhainā	52,531	7,404	14.1	9.35	18.84
Lāna'i	11,059	1,426	12.9	7.31	18.48
Moloka'i	22,276	6,450	29.0	23.92	33.99
<b>Kaua'i</b>	165,102	25,055	15.2	13.34	17.01
Hanalei	21,349	2,897	13.6	8.13	19.01
Kapa'a	47,921	7,663	16.0	12.62	19.36
Līhu'e	34,035	3,978	11.7	8.13	15.24
Kōloa	34,294	5,432	15.8	11.87	19.80
Waimea	26,921	4,820	17.9	12.78	23.03

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

Chart 19: ADULT OBESITY, 2000-2003



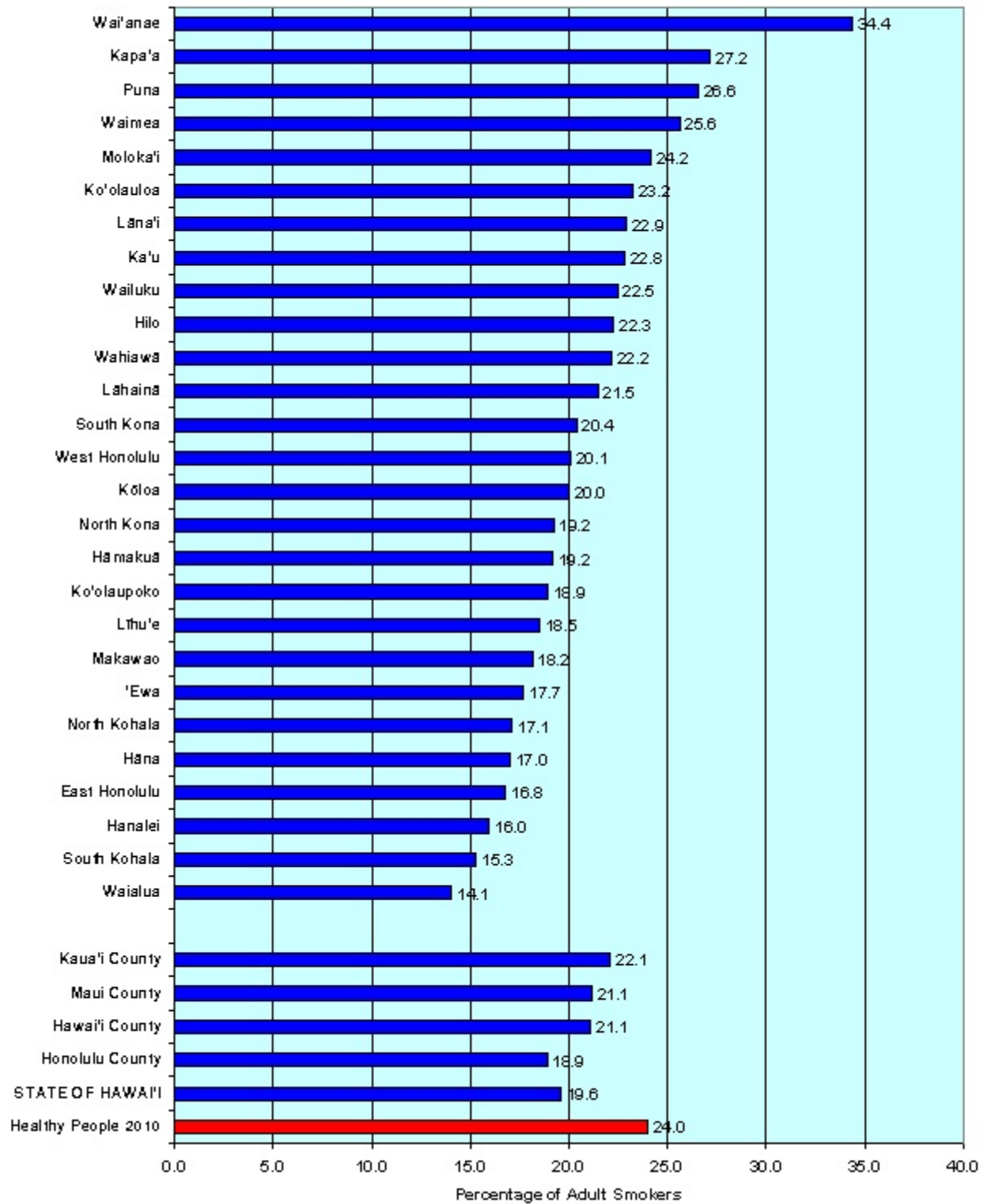
Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Table 15: Adult Smoker, 2000-2003**

Service Area	Number of Respondents	Number of Adults who Smoke	Percent of Adults who Smoke	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	3,711,024	726,778	19.6	18.84	20.33
<b>Honolulu</b>	2,613,175	493,517	18.9	17.91	19.86
East Honolulu	781,458	131,311	16.8	15.18	18.43
West Honolulu	377,712	75,926	20.1	17.37	22.83
'Ewa	784,477	138,849	17.7	15.96	19.44
Wahiawā	97,974	21,722	22.2	16.91	27.44
Wai'anae	111,504	38,328	34.4	28.04	40.70
Waialua	41,810	5,881	14.1	6.62	21.52
Ko'olaupoko	55,412	12,875	23.2	15.48	30.99
Ko'olaupoko	362,632	68,625	18.9	16.35	21.49
<b>Hawai'i</b>	436,753	92,233	21.1	19.66	22.58
Hilo	151,447	33,751	22.3	19.75	24.82
Puna	55,509	14,742	26.6	21.87	31.25
Ka'u	31,205	7,124	22.8	17.76	27.90
South Kona	29,179	5,948	20.4	14.92	25.84
North Kona	93,541	17,981	19.2	16.11	22.33
South Kohala	39,694	6,072	15.3	11.26	19.33
North Kohala	15,422	2,643	17.1	10.19	24.08
Hāmākua	20,705	3,973	19.2	12.91	25.47
<b>Maui</b>	379,217	80,195	21.2	19.47	22.82
Hāna	6,045	1,029	17.0	4.91	29.15
Makawao	108,211	19,641	18.2	15.46	20.84
Wailuku	175,683	39,469	22.5	19.69	25.24
Lāhainā	53,818	11,552	21.5	16.99	25.94
Lāna'i	11,115	2,546	22.9	16.47	29.34
Moloka'i	23,051	5,569	24.2	19.06	29.26
<b>Kaua'i</b>	167,987	37,170	22.1	19.92	24.33
Hanalei	21,465	3,424	16.0	10.15	21.75
Kapa'a	48,925	13,294	27.2	22.90	31.44
Līhu'e	34,959	6,470	18.5	13.93	23.08
Kōloa	35,015	6,997	20.0	15.40	24.56
Waimea	27,042	6,926	25.6	19.57	31.65

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

Chart 20: ADULT SMOKERS, 2000-2003



Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

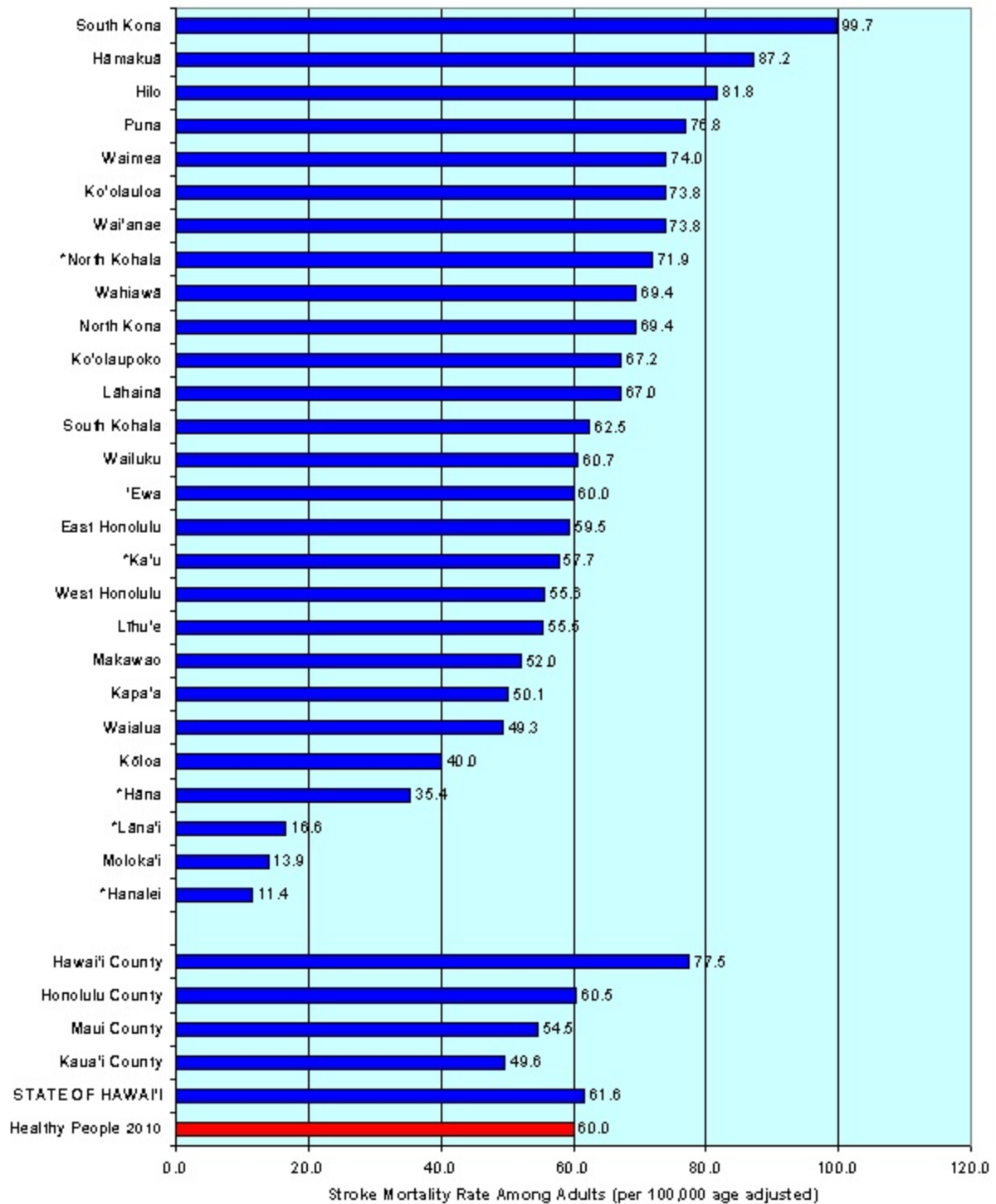
**Table 16: Stroke Mortality Rate (age adjusted), 2000-2003**

Service Area	Population	Number of Stroke Deaths	Stroke Mortality Rate (per 100,000 age adjusted)	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	4,934,857	3,040	61.6	61.63	61.64
<b>Honolulu</b>	3,553,979	2,157	60.5	60.47	60.47
East Honolulu	966,628	877	59.5	59.48	59.49
West Honolulu	541,719	359	55.6	55.64	55.65
'Ewa	1,106,372	449	60.0	59.99	60.00
Wahiawā	155,641	75	69.4	69.43	69.45
Wai'anae	171,417	73	73.8	73.77	73.78
Waialua	56,898	24	49.3	49.27	49.30
Ko'olaupoko	76,661	37	73.8	73.77	73.80
Ko'olaupoko	478,623	263	67.2	67.22	67.24
<b>Hawai'i</b>	613,694	482	77.5	77.45	77.47
Hilo	195,595	216	81.8	81.75	81.78
Puna	129,341	72	76.8	76.80	76.83
Ka'u	24,052	15	57.7	—	—
South Kona	35,453	33	99.7	99.68	99.74
North Kona	117,817	67	69.4	69.37	69.39
South Kohala	54,201	22	62.5	62.44	62.48
North Kohala	24,923	18	71.9	—	—
Hāmākua	32,312	39	87.2	87.15	87.23
<b>Maui</b>	528,983	261	54.5	54.52	54.53
Hāna	7,652	2	35.4	—	—
Makawao	150,459	61	52.0	52.03	52.05
Wailuku	253,045	150	60.7	60.66	60.68
Lāhainā	74,112	39	67.0	67.02	67.06
Lāna'i	13,171	3	16.6	—	—
Moloka'i	29,934	4	13.9	—	—
<b>Kaua'i</b>	238,201	131	49.7	49.64	49.66
Hanalei	25,864	2	11.4	—	—
Kapa'a	75,478	33	50.1	50.11	50.14
Līhu'e	48,982	35	55.5	55.44	55.49
Kōloa	52,336	26	40.0	40.00	40.04
Waimea	34,889	35	74.0	73.95	74.02

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than the standardized ratio of 200, implying that the rates were not significantly higher than those of the State of Hawai'i. See Family Health Outcomes project (FHOP), Guidelines for Using Federal Data Templates with Small Numbers (May 1, 1997).

**Chart 21: STROKE MORTALITY RATE, 2000-2003**



**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

\* Same data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

**Table 17:** Chronic Heart Disease (CHD) Mortality Rate (age adjusted), 2000-2003

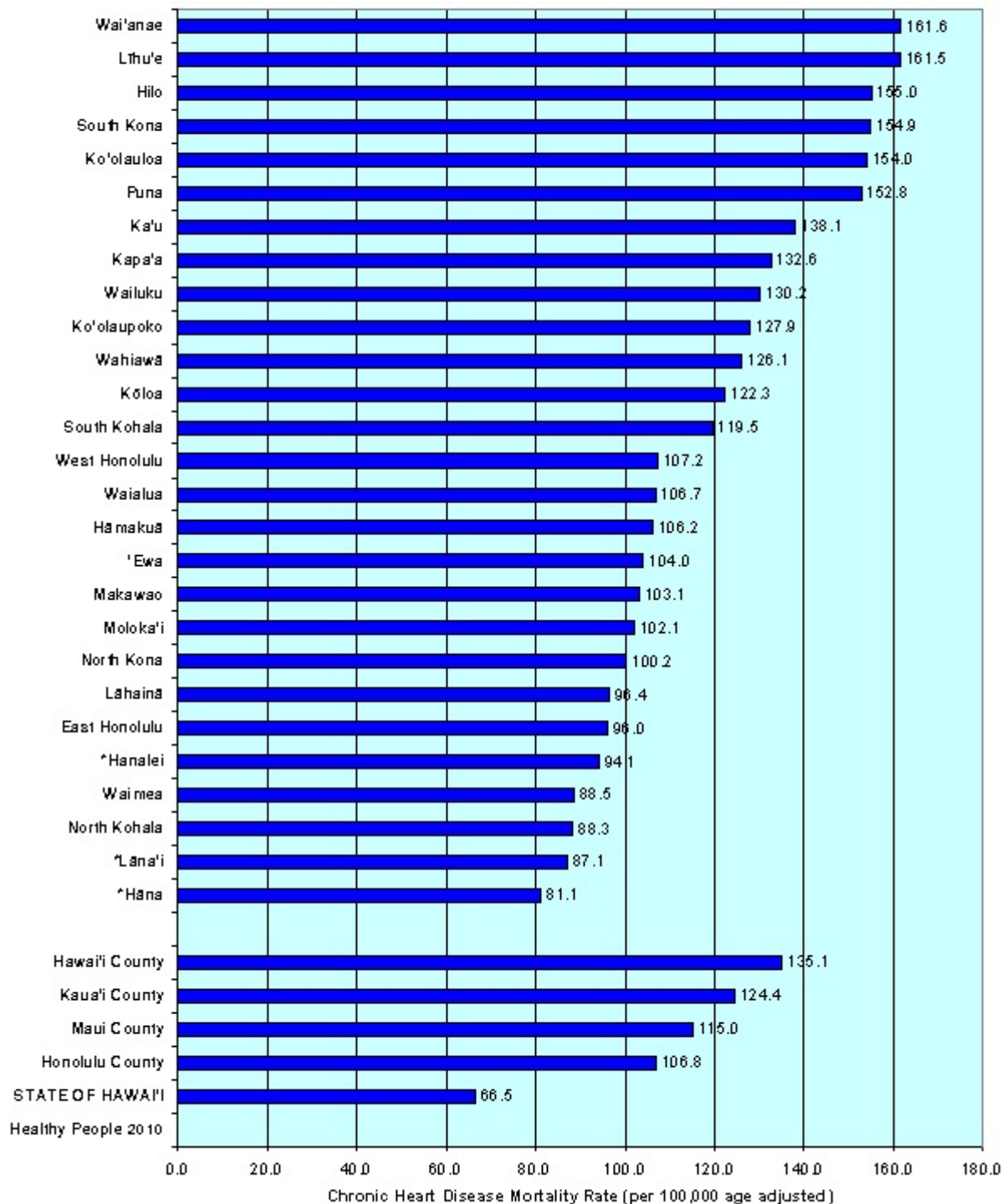
Service Area	Population	Number of CHD Deaths	CHD Mortality Rate (per 100,000 age adjusted)	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	4,934,857	595,055	66.5	66.48	66.53
<b>Honolulu</b>	3,553,979	3,857	106.8	106.78	106.79
East Honolulu	966,628	1,374	96.0	96.00	96.01
West Honolulu	541,719	679	107.2	107.19	107.21
'Ewa	1,106,372	833	104.0	103.98	103.99
Wahiawā	155,641	126	126.1	126.09	126.11
Wai'anae	171,417	182	161.7	161.63	161.66
Waialua	56,898	53	106.7	106.69	106.74
Ko'olaupoko	76,661	79	154.0	154.00	154.04
Ko'olaupoko	478,623	531	127.9	127.91	127.93
<b>Hawai'i</b>	613,694	865	135.1	135.10	135.12
Hilo	195,595	396	155.0	154.97	155.01
Puna	129,341	153	152.8	152.74	152.78
Ka'u	24,052	37	138.1	138.04	138.14
South Kona	35,453	56	154.9	154.84	154.92
North Kona	117,817	107	100.2	100.18	100.22
South Kohala	54,201	46	119.5	119.46	119.51
North Kohala	24,923	23	88.3	88.22	88.30
Hāmākua	32,312	47	106.2	106.11	106.19
<b>Maui</b>	528,983	557	115.0	115.01	115.03
Hāna	7,652	5	81.1	—	—
Makawao	150,459	127	103.1	103.11	103.14
Wailuku	253,045	321	130.2	130.23	130.25
Lāhainā	74,112	58	96.4	96.37	96.41
Lāna'i	13,171	14	87.1	—	—
Moloka'i	29,934	31	102.1	102.04	102.11
<b>Kaua'i</b>	238,201	328	124.4	124.36	124.39
Hanalei	25,864	19	94.1	—	—
Kapa'a	75,478	88	132.6	132.54	132.59
Līhu'e	48,982	105	161.5	161.42	161.50
Kōloa	52,336	78	122.3	122.25	122.32
Waimea	34,889	38	88.5	88.47	88.54

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than the standardized ratio of 200, implying that the rates were not significantly higher than those of the State of Hawai'i. See Family Health Outcomes project (FHOP), Guidelines for Using Federal Data Templates with Small Numbers (May 1, 1997).



**Chart 22: CHRONIC HEART DISEASE MORTALITY RATE, 2000-2003**



**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

\* Same data is too small to calculate reliable measures. Unstable measures are not useful in making decisions.

**Table 18: CHRONIC DISEASE HEALTH RISK INDICATORS, 2000-2003**

Service Area	Percent with Diabetes	Percent Obese	Percent of Adults who Smoke	Stroke Mortality Rate (per 100,000 age adjusted)	CHD Mortality Rate (per 100,000 age adjusted)
<b>State</b>	6.2	16.8	19.6	61.6	66.5
<b>Honolulu</b>	6.2	16.6	18.9	60.5	106.8
East Honolulu	5.4	12.4	16.8	59.5	96.0
West Honolulu	5.9	14.5	20.1	55.6	107.2
'Ewa	6.2	17.7	17.7	60.0	104.0
Wahiawā	7.3	15.3	22.2	69.4	126.1
Wai'anae	7.9	31.5	34.4	73.8	161.7
Waialua	9.6	23.1	14.1	49.3	106.7
Ko'olauloa	5.2	26.3	23.2	73.8	154.0
Ko'olaupoko	7.4	18.7	18.9	67.2	127.9
<b>Hawai'i</b>	6.3	18.6	21.1	77.5	135.1
Hilo	6.8	19.6	22.3	81.8	155.0
Puna	4.4	18.4	26.6	76.8	152.8
Ka'u	7.3	22.4	22.8	57.7	138.1
South Kona	8.8	17.4	20.4	99.7	154.9
North Kona	4.2	16.9	19.2	69.4	100.2
South Kohala	3.2	20.3	15.3	62.5	119.5
North Kohala	12.0	17.2	17.1	71.9	88.3
Hāmākua	13.6	13.0	19.2	87.2	106.2
<b>Maui</b>	6.1	17.2	21.2	54.5	115.0
Hāna	6.1	9.3	17.0	35.4	81.1
Makawao	4.1	14.3	18.2	52.0	103.1
Wailuku	7.1	18.9	22.5	60.7	130.2
Lāhainā	5.4	14.1	21.5	67.0	96.4
Lāna'i	5.6	12.9	22.9	16.6	87.1
Moloka'i	8.9	29.0	24.2	13.9	102.1
<b>Kaua'i</b>	5.5	15.2	22.1	49.7	124.4
Hanalei	1.1	13.6	16.0	11.4	94.1
Kapa'a	4.9	16.0	27.2	50.1	132.6
Līhu'e	6.2	11.7	18.5	55.5	161.5
Kōloa	6.9	15.8	20.0	40.0	122.3
Waimea	7.0	17.9	25.6	74.0	88.5

**Table 19: RANKING BASED ON CHRONIC DISEASE RISK SCORES**

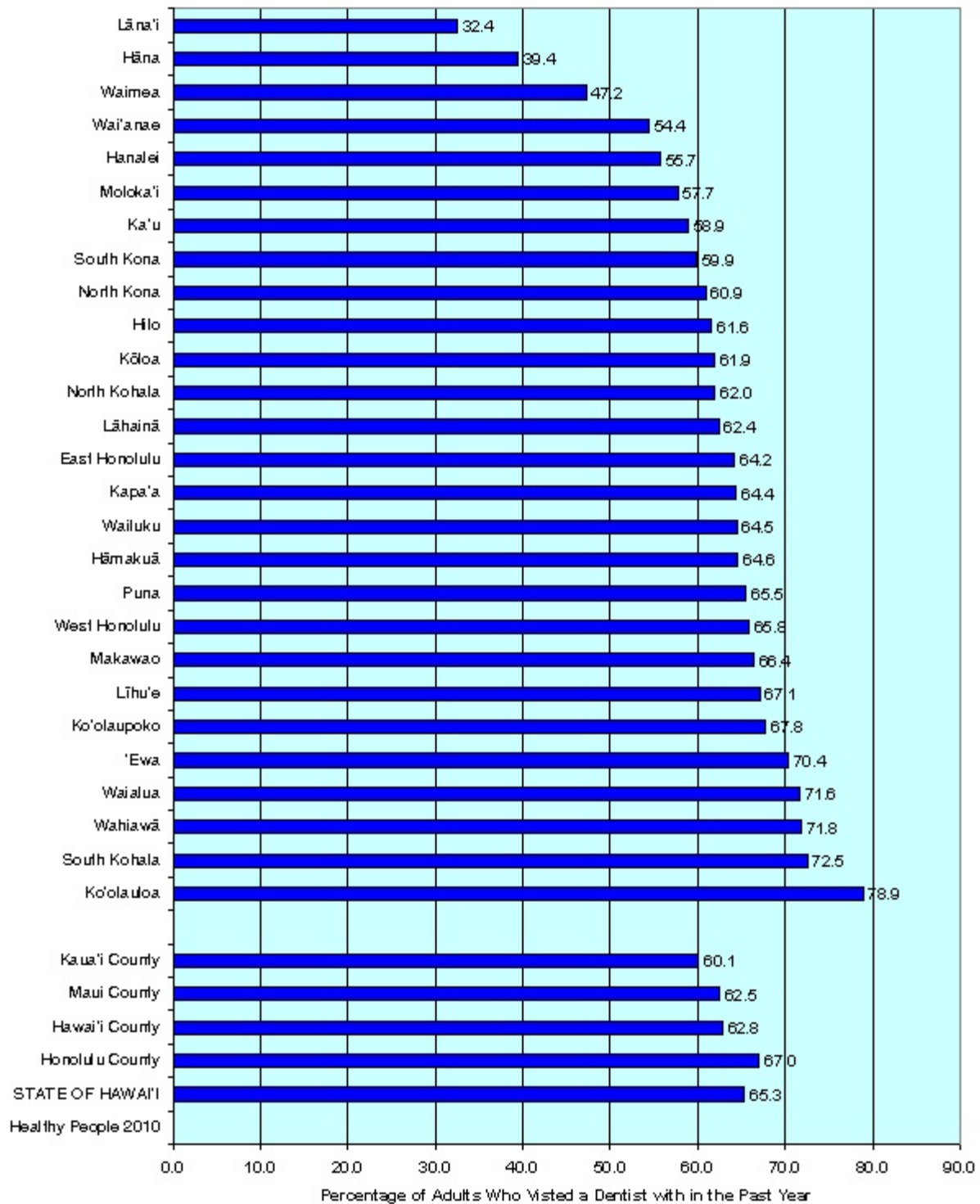
Service Area County-wide	Risk Rank	Risk Score	Service Area State-wide	Risk Rank	Risk Score
<b>Honolulu</b>	<i>(highest)</i>		<b>State of Hawai'i</b>	<i>(highest)</i>	
Wai'anae	1	8.68	Wai'anae	1	8.68
Ko'olauloa	2	3.72	South Kona	2	4.03
Wahiawā	3	0.89	Ko'olauloa	3	3.72
Ko'olaupoko	4	0.79	Hilo	4	3.25
Waialua	5	-0.26	Puna	5	2.79
'Ewa	6	-1.41	Ka'u	6	2.34
West Honolulu	7	-1.67	Hāmākua	7	2.29
East Honolulu	8	-3.30	Wailuku	8	1.33
	<i>(lowest)</i>		Moloka'i	9	1.06
<b>Hawai'i</b>	<i>(highest)</i>		Wahiawā	10	0.89
South Kona	1	4.03	Waimea	11	0.80
Hilo	2	3.25	Ko'olaupoko	12	0.79
Puna	3	2.79	North Kohala	13	0.59
Ka'u	4	2.34	Kapa'a	14	0.58
Hāmākua	5	2.29	Waialua	15	-0.26
North Kohala	6	0.59	Līhu'e	16	-0.36
North Kona	7	-1.69	Kōloa	17	-1.20
South Kohala	8	-1.92	'Ewa	18	-1.41
	<i>(lowest)</i>		Lāhainā	19	-1.51
<b>Maui</b>	<i>(highest)</i>		West Honolulu	20	-1.67
Wailuku	1	1.33	North Kona	21	-1.69
Moloka'i	2	1.06	South Kohala	22	-1.92
Lāhainā	3	-1.51	Makawao	23	-3.19
Makawao	4	-3.19	East Honolulu	24	-3.30
Lāna'i	5	-4.08	Lāna'i	25	-4.08
Hāna	6	-5.28	Hāna	26	-5.28
	<i>(lowest)</i>		Hanalei	27	-7.27
<b>Kaua'i</b>	<i>(highest)</i>			<i>(lowest)</i>	
Waimea	1	0.80			
Kapa'a	2	0.58			
Līhu'e	3	-0.36			
Kōloa	4	-1.20			
Hanalei	5	-7.27			
	<i>(lowest)</i>				

**Table 20:** Visited Dentist within the Past Year, 2002

Service Area	Number of Respondents	Number Who Visited Dentist	Percent Who Visited Dentist w/in Past Year	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	927,310	605,992	65.4	63.74	66.96
<b>Honolulu</b>	653,304	438,004	67.0	64.94	69.15
East Honolulu	209,611	134,668	64.3	60.74	67.75
West Honolulu	90,299	59,451	65.8	59.64	72.04
'Ewa	193,706	136,276	70.4	66.49	74.21
Wahiawā	27,633	19,838	71.8	60.68	82.90
Wai'anae	25,630	13,938	54.4	42.55	66.22
Waialua	7,592	5,438	71.6	53.53	89.74
Ko'olaupoko	12,473	9,840	78.9	66.52	91.25
Ko'olaupoko	86,361	58,556	67.8	62.15	73.46
<b>Hawai'i</b>	109,798	68,958	62.8	59.66	65.95
Hilo	39,185	24,136	61.6	56.09	67.10
Puna	13,860	9,081	65.5	56.58	74.46
Ka'u	7,348	4,327	58.9	47.75	70.02
South Kona	6,954	4,163	59.9	48.37	71.35
North Kona	23,871	14,536	60.9	53.98	67.81
South Kohala	10,071	7,303	72.5	62.76	82.26
North Kohala	3,154	1,956	62.0	43.46	80.54
Hāmākua	5,355	3,457	64.6	51.13	77.99
<b>Maui</b>	95,081	59,395	62.5	59.02	65.91
Hāna	1,259	496	39.4	6.65	72.20
Makawao	27,789	18,443	66.4	60.19	72.55
Wailuku	40,724	26,249	64.5	59.02	69.89
Lāhainā	13,707	8,554	62.4	52.21	72.60
Lāna'i	3,831	1,242	32.4	22.93	41.91
Moloka'i	7,397	4,270	57.7	48.15	67.31
<b>Kaua'i</b>	42,194	25,363	60.1	55.33	64.89
Hanalei	5,960	3,319	55.7	41.82	69.54
Kapa'a	12,083	7,782	64.4	56.04	72.77
Līhu'e	8,175	5,484	67.1	57.00	77.16
Kōloa	8,698	5,381	61.9	52.20	71.53
Waimea	7,195	3,397	47.2	33.95	60.48

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Chart 23: DENTIST VISIT WITHIN PAST YEAR, 2002**



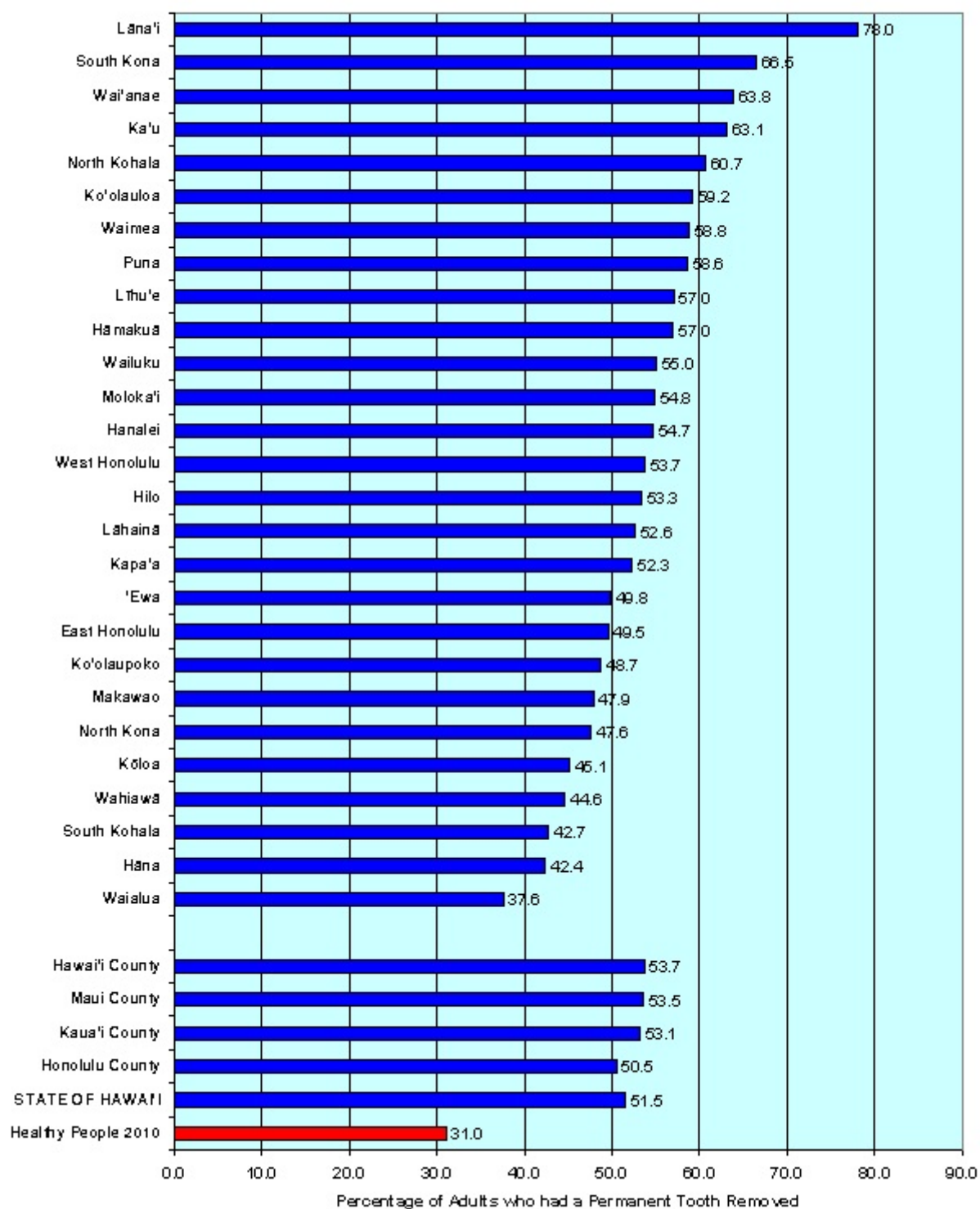
**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Table 21: Permanent Teeth Removed, 2002**

Service Area	Number of Respondents	Number Who had any Permanent Teeth Removed	Percent Who had Any Permanent Teeth Removed	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	924,485	475,865	51.5	49.78	53.17
<b>Honolulu</b>	650,420	328,340	50.5	48.25	52.71
East Honolulu	207,074	102,564	49.5	45.87	53.19
West Honolulu	90,831	48,765	53.7	47.46	59.91
'Ewa	193,743	96,461	49.8	45.57	54.01
Wahiawā	27,377	12,215	44.6	31.61	57.63
Wai'anae	25,566	16,315	63.8	53.17	74.46
Waialua	7,651	2,875	37.6	15.47	59.67
Ko'olauloa	12,473	7,383	59.2	44.22	74.16
Ko'olaupoko	85,705	41,764	48.7	42.68	54.78
<b>Hawai'i</b>	109,208	58,595	53.7	50.41	56.89
Hilo	38,778	20,665	53.3	47.64	58.94
Puna	13,954	8,171	58.6	49.37	67.73
Ka'u	7,367	4,646	63.1	51.95	74.17
South Kona	7,000	4,652	66.5	55.44	77.48
North Kona	23,846	11,361	47.6	40.75	54.54
South Kohala	9,954	4,251	42.7	32.22	53.20
North Kohala	3,154	1,913	60.7	42.51	78.80
Hāmākua	35,718	2,937	57.0	42.05	71.89
<b>Maui</b>	95,525	51,118	53.5	49.99	57.03
Hāna	1,259	534	42.4	8.67	76.12
Makawao	27,576	13,196	47.9	41.36	54.35
Wailuku	41,352	22,763	55.1	49.47	60.62
Lāhainā	13,707	7,208	52.6	42.35	62.83
Lāna'i	3,860	3,010	78.0	69.19	86.81
Moloka'i	7,397	4,053	54.8	45.00	64.60
<b>Kaua'i</b>	42,169	22,394	53.1	48.30	57.91
Hanalei	5,904	3,228	54.7	40.94	68.41
Kapa'a	12,147	6,352	52.3	43.62	60.97
Līhu'e	8,040	4,584	57.0	46.37	67.68
Kōloa	8,800	3,971	45.1	35.24	55.01
Waimea	7,195	4,231	58.8	45.47	72.15

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Chart 24: PERMANENT TEETH REMOVAL, 2002**



**Source:** State of Hawaiʻi, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

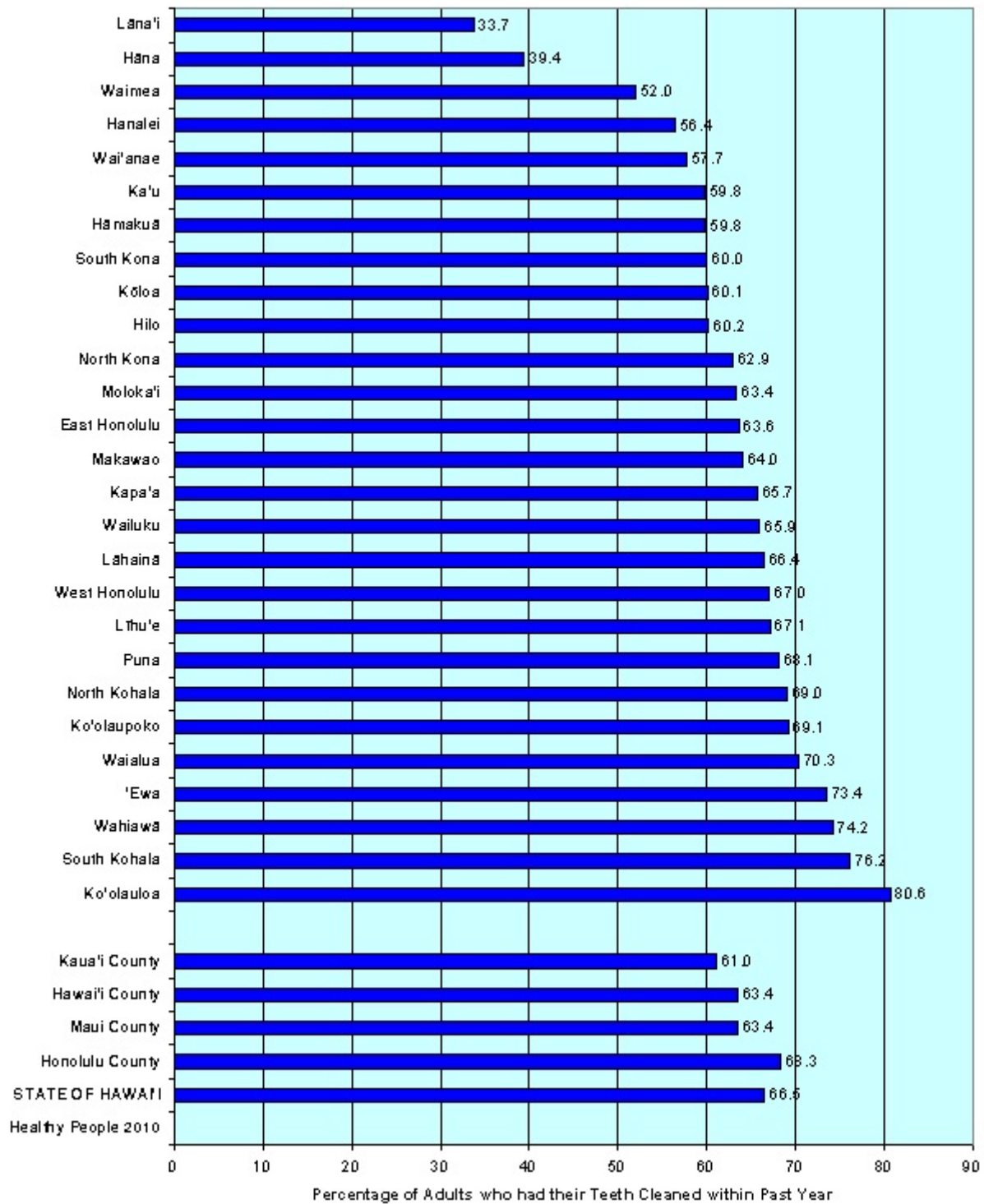
**Table 22: Teeth Cleaned within Past Year, 2002**

Service Area	Number of Respondents	Number Who Had Teeth Cleaned within Past Year	Percent Who had Teeth Cleaned within Past Year	95% Confidence Interval	
				Lower Limit	Upper Limit
<b>State</b>	894,745	595,055	66.5	64.88	68.13
<b>Honolulu</b>	633,900	433,000	68.3	66.20	70.41
East Honolulu	206,327	131,153	63.6	60.00	67.13
West Honolulu	88,950	59,633	67.0	60.84	73.24
'Ewa	185,790	136,460	73.5	69.72	77.18
Wahiawā	26,603	19,728	74.2	63.10	85.22
Wai'anae	23,848	13,762	57.7	45.71	69.70
Waialua	6,808	4,787	70.3	49.97	90.66
Ko'olaupoko	12,078	9,740	80.6	68.70	92.58
Ko'olaupoko	83,497	57,737	69.2	63.48	74.82
<b>Hawai'i</b>	104,804	66,472	63.4	60.17	66.68
Hilo	37,842	22,775	60.2	54.49	65.88
Puna	12,880	8,766	68.1	58.86	77.25
Ka'u	6,950	4,155	59.8	48.31	71.25
South Kona	6,498	3,899	60.0	47.68	72.33
North Kona	22,760	14,312	62.9	55.75	70.01
South Kohala	9,760	7,436	76.2	66.58	85.80
North Kohala	3,013	2,079	69.0	51.22	86.78
Hāmākua	5,100	3,051	59.8	45.30	74.35
<b>Maui</b>	90,281	57,262	63.4	59.91	66.95
Hāna	1,259	496	39.4	6.65	72.20
Makawao	26,811	17,160	64.0	57.56	70.44
Wailuku	38,345	25,277	65.9	60.37	71.48
Lāhainā	13,052	8,668	66.4	56.22	76.60
Lāna'i	3,671	1,238	33.7	23.72	43.73
Moloka'i	6,790	4,303	63.4	54.17	72.57
<b>Kaua'i</b>	40,695	24,832	61.0	56.20	65.84
Hanalei	5,740	3,238	56.4	42.14	70.69
Kapa'a	11,626	7,635	65.7	57.13	74.21
Līhu'e	7,756	5,204	67.1	56.83	77.37
Kōloa	8,692	5,221	60.1	50.27	69.85
Waimea	6,797	3,534	52.0	38.51	65.47

**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).



**Chart 25: TEETH CLEANING, 2002**



**Source:** State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS).

**Table 23: ORAL HEALTH RISK INDICATORS, 2002**

Service Area	Percent Who Visited Dentist within Past Year	Percent Who had Any Permanent Teeth Removed	Percent Who had Teeth Cleaned within Past Year
<b>State</b>	65.4	51.5	66.5
<b>Honolulu</b>	67.0	50.5	68.3
East Honolulu	64.3	49.5	63.6
West Honolulu	65.8	53.7	67.0
'Ewa	70.4	49.8	73.5
Wahiawā	71.8	44.6	74.2
Wai'anae	54.4	63.8	57.7
Waialua	71.6	37.6	70.3
Ko'olaupoko	78.9	59.2	80.6
Ko'olaupoko	67.8	48.7	69.2
<b>Hawai'i</b>	62.8	53.7	63.4
Hilo	61.6	53.3	60.2
Puna	65.5	58.6	68.1
Ka'u	58.9	63.1	59.8
South Kona	59.9	66.5	60.0
North Kona	60.9	47.6	62.9
South Kohala	72.5	42.7	76.2
North Kohala	62.0	60.7	69.0
Hāmākua	64.6	57.0	59.8
<b>Maui</b>	62.5	53.5	63.4
Hāna	39.4	42.4	39.4
Makawao	66.4	47.9	64.0
Wailuku	64.5	55.1	65.9
Lāhainā	62.4	52.6	66.4
Lāna'i	32.4	78.0	33.7
Moloka'i	57.7	54.8	63.4
<b>Kaua'i</b>	60.1	53.1	61.0
Hanalei	55.7	54.7	56.4
Kapa'a	64.4	52.3	65.7
Līhu'e	67.1	57.0	67.1
Kōloa	61.9	45.1	60.1
Waimea	47.2	58.8	52.0

**Table 24: RANKING BASED ON ORAL HEALTH RISK SCORES**

Service Area County-wide	Risk Rank	Risk Score
<b>Honolulu</b>	<i>(highest)</i>	
Wai'anae	1	2.5
East Honolulu	2	-0.8
West Honolulu	3	-0.8
Ko'olaupoko	4	-1.8
'Ewa	5	-2.4
Ko'olauloa	6	-2.9
Wahiawā	7	-3.2
Waialua	8	-3.6
	<i>(lowest)</i>	
<b>Hawai'i</b>	<i>(highest)</i>	
South Kona	1	2.0
Ka'u	2	1.7
Hāmākua	3	0.4
Hilo	4	0.3
North Kohala	5	0.2
Puna	6	-0.3
North Kona	7	-0.6
South Kohala	8	-3.7
	<i>(lowest)</i>	
<b>Maui</b>	<i>(highest)</i>	
Lāna'i	1	8.8
Hāna	2	3.3
Moloka'i	3	0.5
Wailuku	4	-0.4
Lāhainā	5	-0.5
Makawao	6	-1.2
	<i>(lowest)</i>	
<b>Kaua'i</b>	<i>(highest)</i>	
Waimea	1	3.2
Hanalei	2	1.4
Līhu'e	3	-0.6
Kapa'a	4	-0.7
Kōloa	5	-0.7
	<i>(lowest)</i>	

Service Area State-wide	Risk Rank	Risk Score
<b>State of Hawai'i</b>	<i>(highest)</i>	
Lāna'i	1	8.8
Hāna	2	3.3
Waimea	3	3.2
Wai'anae	4	2.5
South Kona	5	2.0
Ka'u	6	1.7
Hanalei	7	1.4
Moloka'i	8	0.5
Hāmākua	9	0.4
Hilo	10	0.3
North Kohala	11	0.2
Puna	12	-0.3
Wailuku	13	-0.4
Lāhainā	14	-0.5
Līhu'e	15	-0.6
North Kona	16	-0.6
Kapa'a	17	-0.7
Kōloa	18	-0.7
East Honolulu	19	-0.8
West Honolulu	20	-0.8
Makawao	21	-1.3
Ko'olaupoko	22	-1.8
'Ewa	23	-2.4
Koolauloa	24	-2.9
Wahiawā	25	-3.2
Waialua	26	-3.6
South Kohala	27	-3.7
	<i>(lowest)</i>	

